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ABSTRACT

These hearings addressed cooperative efforts of the United States and the People's Republic of China under the 1979 agreement on science and technology. Thus far, there are more than 20 signed protocols (included in appendices) implementing the agreement in various scientific and technological areas. Activities in such areas as energy, health, communications, transportation, and management science have important implications for development of trade between the two countries; useful exchanges in these areas are essential ingredients for an economic and commercial relationship benefiting both nations. The hearings include an overview of the activity under the 1979 agreement from the State Department (which is responsible for coordinating the United States-China science and technology relationship on a daily basis) and testimony on the history and status of two protocols involving the Department of Commerce, the protocol-related work of the Department of Energy, and prospects for a newly signed protocol of the Department of Transportation. The information provided will be used to review the protocols to identify where important progress has been made (and where it has not) and to learn about any special problems that may exist to help overcome impediments to fuller cooperation, and to develop stronger ties. (JN)

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SCIENCE AND TECHNOLOGY: COOPERATION BETWEEN THE UNITED STATES AND CHINA

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HEARINGS

BEFORE THE

SPECIAL SUBCOMMITTEE ON
U.S. TRADE WITH CHINA

OF THE

COMMITTEE ON
ENERGY AND COMMERCE
HOUSE OF REPRESENTATIVES

NINETY-EIGHTH CONGRESS

FIRST SESSION

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SCIENCE AND TECHNOLOGY: COOPERATION BETWEEN THE UNITED STATES AND CHINA

MONDAY, OCTOBER 31, 1983

HOUSE OF REPRESENTATIVES,
SPECIAL SUBCOMMITTEE ON
U.S. TRADE WITH CHINA,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to call, at 10:30 a.m., in room 2322, Rayburn House Office Building, Hon. Al Swift (chairman of the subcommittee) presiding.

Present: Representatives Swift, Sikorski, and Lent.

Staff present: Frank Potter, chief counsel; Michael Kitzmiller, professional staff coordinator; Greg Mounts, professional staff; and Don Bosco, minority staff.

Mr. SWIFT. Good morning.

Today's hearing, the first of two on this issue, will address the cooperative efforts of the United States and the People's Republic of China under the 1979 agreement on science and technology.

So far, there are more than 20 signed protocols implementing the agreement in a host of scientific and technological areas. Activities in areas such as energy, health, communications, transportation, and management science have important implications for the development of trade between our two countries. Useful exchanges in these areas are essential ingredients for an economic and commercial relationship that benefits both nations.

The subcommittee is interested in reviewing the history and status of protocols to identify where important progress has been made—and where it has not. We are interested in learning about any special problems that may exist so that we may help overcome impediments to fuller cooperation and stronger ties.

I would like to welcome our witnesses today. We will hear an overview of the activity under the 1979 agreement from the State Department. State is responsible for coordinating the United States-China science and technology relationship on a daily basis.

Following that, we will hear testimony on the history and status of the two protocols involving the Department of Commerce. We will hear about the protocol-related work of the Department of Energy, and, finally, we will hear about the prospects for the newly signed protocol of the Department of Transportation.

In our second hearing on this issue, scheduled for Thursday, November 3, at 2 p.m., we will hear testimony from the Department of Health and Human Services, the Environmental Protection Agency, the National Aeronautics and Space Administration, and the Nuclear Regulatory Commission.

I will recognize the gentleman from New York for comment.

Mr. LENT. Thank you, Mr. Chairman.

I also want to thank our witnesses for appearing before this subcommittee this morning. The program of scientific and technological cooperation between the United States and China is a significant expression of our growing friendship with China, and along with the direct scientific and technological benefits of such cooperation and the furtherance of foreign policy objectives, significant trade opportunities for U.S. firms may be generated.

Clearly the U.S. agencies involved in the cooperative efforts can do much to assist the United States private sector by providing information as to China's foreign procurement needs. Active and direct contact between the engineers, scientists, and technical personnel in China and the specialized technical agencies of the U.S. Government will work to maximize the benefits of their effort, and is to be encouraged.

As a result of my visits to China along with the chairman, particularly, with the committee, I feel that there are great opportunities for the United States and China to expand our commercial ties based on equality, reciprocity, and mutual benefit. So we look forward to your testimony.

And thank you for giving me this opportunity, Mr. Chairman.

Mr. SWIFT. Thank you, gentlemen.

Mr. Horner, I understand you have some prepared remarks this morning. Those will be included in the record without objection. Following your comments, the subcommittee will have questions for you.

You may proceed as you wish.

STATEMENT OF CHARLES HORNER, DEPUTY ASSISTANT SECRETARY FOR SCIENCE AND TECHNOLOGY AFFAIRS, U.S. DEPARTMENT OF STATE, ACCOMPANIED BY DONALD C. FERGUSON, DIRECTOR, OFFICE OF COOPERATIVE SCIENCE AND TECHNOLOGY PROGRAMS, U.S. DEPARTMENT OF STATE

Mr. HORNER. Thank you very much, Mr. Chairman.

I would like to mention first that I am accompanied this morning by Mr. Donald Ferguson, who is the Director of the Office of Technology programs in the Department of State and who serves also as U.S. Executive Secretary to the Joint China-United States Commission on Scientific and Technological Cooperation.

Mr. SWIFT. If you don't mind, we will go ahead for the sake of the record and identify Mr. Lawson at this point and down the line have some exchange.

Mr. LAWSON. I am Gene Lawson, Deputy Assistant Secretary for East Asia and the Pacific, Department of Commerce, Mr. Chairman.

Mr. SWIFT. Mr. Horner, I identified you, but would you identify yourself?

Mr. HORNER. Charles Horner, Deputy Assistant Secretary of State for Science and Technology.

Mr. Swift. Thank you very much.

Mr. Horner. As you mentioned, Mr. Chairman, we have a governing agreement on science and technology with the People's Republic of China which dates from 1979, even though official science and technology cooperation between the United States and China had begun some months earlier with the signing of agreements in agriculture, space, and student/scholar exchanges late in 1978.

The China program is today the most active bilateral science and technology intergovernmental program that the United States has. In less than 5 years of this formal science and technology relationship, about 300 specific exchanges in projects ranging from visits by individual scientists to major cooperative research programs in areas such as medicine and earthquakes have either been carried out or are in the process of implementation.

I should also like to stress that the science and technology program receives the personal attention of senior officials in both of our countries. It affords the United States excellent opportunities for frequent and very positive contacts with Chinese leaders at high levels. It fosters the rapid development of personal and institutional ties between the science and technology establishments of our two countries both within the framework of the specific protocols and within an independent relationship between U.S. scientists and their Chinese colleagues.

And of particular interest to us are the extensive nonofficial contacts. Scores of U.S. colleges and universities have at least one formal cooperative or exchange agreement with an institution in China. Many of our universities have multiple ties.

New relationships are continually being established. All these relationships will continue to expand over the years as large numbers of Chinese students and scholars complete their education and/or research in this country.

There are now more than 10,000 Chinese studying in our country and about half of them are sponsored by the Chinese Government. The rest are studying under private auspices and about 80 percent of these students are studying in areas of science and technology.

We feel that, in terms of our broader interests, the science and technology program with China contributes to several objectives of U.S. policy. In encouraging the specific projects that are decided upon by American scientific and technological agencies and counterpart Chinese institutions, we seek to insure that they also serve broader national interests.

Politically, these exchanges add substance to diplomatic contacts and they help to expand relationships both at senior governmental levels and between the scholarly and scientific communities of the two countries.

Of special interest to this subcommittee is the thought that the United States does benefit commercially from Chinese purchases of U.S. products. Many sales are oftentimes an outgrowth of official cooperation in a number of fields.

In a sense, this is a logical consequence of such cooperation because China's import policy is oriented largely toward the acquisition of technology and equipment, and some of the joint Chinese-American research projects exposed the Chinese to American products and to the American approach to scientific research in general.

Finally, I would like to say just a few words about the role of the Department of State in administering this agreement and about our relationship with other agencies and departments in the Federal Government.

The governing agreement of 1979 established a structure for directing and coordinating the science and technology relationship between the United States and China. The agreement created the United States-China Joint Commission on Scientific and Technological Cooperation, which plans and coordinates science and technology cooperation, monitors and facilitates such cooperation and considers proposals for further cooperative activities.

The cochairmen of the Joint Commission are, on the U.S. side, the Science Adviser to the President and the Director of the Office of Science and Technology Policy, Dr. George Keyworth, and for the Chinese, State Councilor Fang Yi.

The Joint Commission has held three meetings, in Peking and Washington, the latest meeting held in May of 1983 and the next meeting is scheduled in Washington in the fall of 1984. The U.S. delegation for the Joint Commission meetings regularly includes senior officials from the various technical agencies which have protocols and understandings with the People's Republic of China.

We brought with us this morning the official report of the third meeting of the Joint Commission, a meeting which took place in Peking on May 10 and 11 of 1983. We would like to submit this for the record.

Mr. SWIFT. We will get it in the record.

[The information follows:]

REPORT OF THE THIRD MEETING
OF THE
U.S.-P.R.C. JOINT COMMISSION
ON SCIENTIFIC AND TECHNOLOGICAL COOPERATION

The Third Meeting of the US-PRC Joint Commission on Scientific and Technological Cooperation took place May 10-11, 1983, in Beijing. The Second Meeting was held in Washington in October 1981.

Dr. George A. Keyworth, the Science Advisor to the President of the United States and Director of the Office of Science and Technology Policy, headed the U.S. Delegation. Fang Yi, State Councillor of the PRC State Science Council and Chairman of the State Science and Technology Commission, headed the Chinese Delegation. A list of the members of the two delegations is attached (Appendix I and Appendix II).

The Joint Commission reviewed the results of cooperation in the 17 fields described below since the Second Meeting, discussed general policy and specific issues related to the bilateral cooperation, and exchanged views on future activities. Also during the meeting additional protocols on Cooperation in Nuclear Physics and Controlled Magnetic Fusion Research, Aeronautical Science and Technology, and Transportation Science and Technology were signed. Furthermore, the Joint Commission decided that the two sides would actively explore cooperation in other new areas.

The Joint Commission noted that there has been new and productive development of the program of scientific and technical cooperation since the Second Meeting. Substantial cooperative work has begun in most areas and has been developing fairly rapidly in several. The two sides held that the cooperative programs are of mutual benefit and are contributing to the continuing development of relations between the two countries and particularly to the strengthening of ties between their respective scientific and technological communities.

The achievements reviewed and plans approved by the Joint Commission are as follows:

1. STUDENTS AND SCHOLARS

Achievements

The Understanding on the Exchange of Students and Scholars between the U.S. and P.R.C. has provided students and scholars from both countries the opportunity to study and do research at universities and scholarly institutions in each other's country.

In 1981-82 the Chinese side sent 1,222 students and scholars and in 1982-83, 1,780 students and scholars to study and work in the United States. The U.S. side sent 620 (46 under its national program) students and scholars in 1981-82 and 1,047 (52 under its national program) students and scholars in 1982-83 to carry out studies and research in the humanities, social sciences and natural sciences in China. At the time of the Third Meeting of the Joint Commission there were an estimated 4,700 Chinese students and scholars in the United States; and there were approximately 250 (about 50 under its national program) American students and scholars (not including students in short-term courses) in China. The Exchange of Students and Scholars has grown and developed under the Science and Technology Agreement.

Future Plans

Since the incorporation of the Understanding on the Exchange of Students and Scholars as a Protocol of the Science and Technology Agreement in January 1979, numerous areas of cooperation have been opened up, providing a wide range of channels and opportunities for exchange and cooperation between the scholarly communities of the two countries. The Joint Commission expects and encourages scholars of the two countries to carry out exchanges and cooperation in various fields. The two sides agreed to have further discussions on arrangements for continued educational and scholarly exchanges between the U.S. and the P.R.C. The Exchange of Students and Scholars has grown and developed under the Science and Technology Agreement.

2. AGRICULTURE

Achievements

Under the minutes of the Third Meeting of the Joint Working Group on Agricultural Science and Technology Cooperation, the Chinese side sent 12 study teams, a total of 45 scientists, to the United States; and the U.S. side dispatched to China 12 study teams involving approximately 40 scientists. In addition, the two sides jointly held the First U.S.-P.R.C. Soybean Science Symposium in 1982 in the State of Illinois; a Chinese delegation of 8 scientists attended this syposium. The Fourth Meeting of the Joint Working Group on Agricultural Science and Technology Cooperation took place on December 6-8, 1982, in Washington, where both sides expressed satisfaction at the execution of the projects specified in the minutes of the Third Meeting of the Joint Working Group.

Future Plans

Both sides agreed to direct the Cooperation on Agricultural Science and Technology between the two countries to greater depth and to develop several forms of exchange, as follows:

(1) teams for study of specific subjects;

(2) cooperative study;

(3) symposia and workshops;

(4) exchange of scholars and training of personnel;

(5) exchange of germplasm; and

(6) to adopt effective measures to promote the role of U.S. Cooperators in strengthening exchanges in agricultural science and technology and economics, and in developing agricultural trade.

The Fifth Meeting of the Joint Working Group will be held in the first half of 1984 in Beijing.

3. SPACE TECHNOLOGY

Achievements

The Oriental Scientific Instrument Import and Export Corporation of the Chinese Academy of Sciences and the Systems and Applied Sciences Corporation (SASC) of the U.S. signed a contract for the purchase of a Landsat ground station in Beijing in December 1982. The Joint Commission expressed satisfaction with this development in the area of space cooperation.

Future Plans

The Joint Commission hopes that, in accordance with the Understanding on Cooperation in Space Technology between the governments of the two countries and the Memorandum of Understanding between NASA and the Chinese Academy of Sciences and through joint effort, a technologically and economically reasonable Landsat ground station will be installed and put into operation on schedule.

Both sides hope that specific measures will be taken to advance cooperation in the field of space technology.

4. HIGH ENERGY PHYSICS

Achievements

The Third Meeting of the U.S.-P.R.C. Joint Committee on High Energy Physics was held in Beijing in March 1982, at which both sides approved the U.S.-P.R.C. Cooperative Program in High Energy Physics for the period March 1982 to June 1983 covering 13 collaborative projects. Through joint effort, seven of these projects have been completed. Three of the remaining ones will be implemented in the first half of this year and the other three will be put off until 1984. Thus far the Chinese side has received 4 American specialists and the U.S. side has hosted 31 Chinese specialists. The Joint Commission has noted that the implementation of the program has been sound and effective.

Future Plans

At the Fourth Meeting of the U.S.-P.R.C. Joint Committee on High Energy Physics, to be held in the latter half of this year, the two sides will consult on further cooperation in the building of Beijing Electron Positron Collider (BEPC), linear proton accelerator applications, new technologies in accelerator building, and issues concerned with the procurement of components and devices for BEPC in the United States.

5. MANAGEMENT OF SCIENCE AND TECHNOLOGY AND SCIENTIFIC AND TECHNICAL INFORMATION

Achievements

Representatives of the U.S. Department of Commerce and the Delegation from the P.R.C. State Science and Technology Commission signed Annexes Two, Three, and Four in Washington on March 1, 1982, specifying further cooperative activities between the two sides in the fields of science and technology management and scientific and technical information. Annex Three described the cooperative program between the National Technical Information Service (NTIS) of the United States and the Institute for Scientific and Technical Information of China (ISTIC). After two Chinese information specialists completed their program at NTIS, four more Chinese specialists arrived to carry out professional work there. In August 1982, an NTIS Delegation visited ISTIC, where the two sides met and signed a Summary of the Talks.

The National Training Center for Industrial Science and Technology Management at Dalian successfully concluded the teaching program for the second and third sessions in 1981 and 1982 respectively, turning out a total of 400 students. The Center provided an opportunity for ~~mutual understanding~~ between the U.S. and P.R.C. and is beneficial to both sides.

Future Plans

Consultations between the two sides are under way concerning the 1983 implementing program under Annex Two. Activities set forth in the Summary of Talks signed in August 1982 by NTIS and ISTIC will be carried out. The teaching program for the fourth session at the Dalian Center will be completed in 1983. The two sides will exchange views on future arrangements since the five-year cooperative progam expires at the end of 1984.

6. METROLOGY AND STANDARDS

Achievements

Under Annex Two of the Protocol on Metrology and Standards, satisfactory results have been achieved in the cooperative program. In 1982, the Chinese side invited nine specialists from the U.S. National Bureau of Standards (NBS) to conduct lectures in China. Four Chinese metrologists are continuing their work started in 1981 at NBS. They include the Chief of the Quantum Laboratory of the National Institute of Metrology, who is, at the invitation of NBS, currently working on research and development of a new type of absolute gravity instrument at Boulder, Colorado. With joint effort from both sides, significant results have been achieved in this cooperative project.

Future Plans

The U.S. side expects that the Chinese metrologists will extend the duration of their work at NBS, so as to bring their ongoing experiments to a successful conclusion which is significant to both sides. The U.S. side is prepared to assist the Chinese side actively in assembling within a short period of time a gravity instrument of the type developed at NBS. The Chinese side will welcome the U.S. side to send specialists to give lectures or to attend international measurement symposia held in China. The two sides will actively seek new topics of mutual interest to give greater depth to the cooperation.

7. ATMOSPHERIC SCIENCES

Achievements

The Third Meeting of the Joint Working Group on Cooperation in Atmospheric Sciences was held in Washington in November 1981, at which the Summary Report and Annexes Five and Six were concluded. The program on the conversion of applications software for processing polar orbiting satellite data provided in Annex Five has been successfully completed, the result of which is beneficial to both sides. In the latter half of 1982, ten Chinese specialists went to the U.S. to carry out the training and participation program at NOAA specified in Item Three, Annex Six. Both sides are satisfied with the cooperation and progress made in the field of atmospheric sciences.

Future Plans

The Summary Report of the Fourth Meeting of the Joint Working Group, held in Beijing in October, 1982, further determined that the two sides would continue to develop cooperation in comparative studies of climates and agriculture of the North China Plain and the North American Great Plains; monsoon research; Tibetan plateau and mountain meteorology; paleoclimatic studies using proxy data; and the exchange of climatic data. A "Semester in China" project will be conducted in 1983 or 1984. The two sides are also exchanging views on other cooperative topics. Twelve Chinese specialists will carry out a training and participation program at NOAA following the completion of the program of the ten specialists who arrived in 1982.

8 MARINE AND FISHERY

Achievements

Since the Second Meeting of the U.S.-P.R.C. Joint Commission, cooperation in marine and fishery science and technology has undergone new development. The two sides have exchanged some new marine data. Scientists from both countries concluded joint studies on two cruises off the Estuary of the Changjiang River in June and November 1981, during which the P.R.C. sent four vessels. More than 100 scientists from both sides participated in this research on sedimentation processes, which involved investigations and research activities in various specialities. In January 1982, twelve Chinese scientists went to relevant U.S. universities and research institutions to participate in data analysis and research on relevant topics.

Ten Chinese personnel will work at U.S. institutions at the latest in the third quarter of 1984. Another five scientists from China will be hosted by the U.S. to participate in marine science investigations, such as on manganese nodules, biological resources, ocean circulation, deep sea and ocean geology, and air-sea interaction studies on board U.S. research vessels. They will go at the latest in the third quarter of 1984.

In order to review the achievements made on the joint sedimentation processes project and exchange views with regard to new advancements in sedimentation dynamics and bottom-layer oceanography, the "Symposium on Sedimentation on the Continental Shelf with Special Reference to the East China Sea" was held by the U.S. and P.R.C. in Hangzhou in April 1983.

Progress has also been made in various degrees in other projects under the Protocol, such as marine services, oceanographic instruments and buoys, marine metrology and standards, marine environmental monitoring and forecast, and aquaculture. During the latter half of 1982, the U.S. Air-Sea Interaction Delegation paid a visit to five coastal cities in China and the P.R.C. Marine Pollution Study Group and Oceanographic Instrumentation Delegations visited the U.S.

The Fourth Meeting of the Joint Working Group was held in Beijing in April 1983. Both sides were pleased with the Marine and Fishery Cooperation, which is beneficial to both sides.

Future Plans

Both sides expressed willingness to continue the implementation of the projects under Category One, deepen the projects under Category Two, and explore the possibility of implementing the projects under Category Three. The cooperation is expected to progress satisfactorily. Both sides expect that the cooperation will continue to experience steady development.

9. MEDICINE AND PUBLIC HEALTH

Achievements

The two sides are carrying out cooperative activities in ten areas. Chinese and American scientists have conducted collaborative research on topics such as hepatitis B vaccine, cardiovascular epidemiology, descriptive investigations in Shanghai County, mental disease, etc. In addition, study groups, lecture tours, symposia, and workshops have been conducted.

Future Plans

At the Third Meeting of the U.S.-P.R.C. Joint Committee on Medicine and Public Health, held in Bethesda, Maryland, in November, 1982, the two sides signed Annex Three to the Protocol, setting forth the cooperative program for the next two years. In addition to continuing the activities listed in Annex One and Annex Two, collaborative research topics will also include studies of the morbidity and mortality of viral hepatitis and studies on HBV-related diseases at selected sites in rural areas, child health, nutrition hygiene, abnormal allergy, etc. Collaborative research projects of mutual interest in other areas will also be explored. The Fourth Meeting of the U.S.-P.R.C. Joint Committee on Medicine and Public Health will be held at an appropriate time in 1984 in Beijing to discuss the progress made on the above-mentioned projects and future plans.

10. HYDROPOWER

Achievements

Under Annex One to the Protocol between the U.S. and the P.R.C. on Cooperation in Hydropower, the P.R.C. was to send a team on estuary regulation and another on power grid technology to the U.S. The two activities were successfully carried out in February and September 1982. In June 1982, a grant agreement was signed in Beijing between the U.S. Trade and Development Program and the Department of Foreign Affairs of the P.R.C. Ministry of Water Resources and Electric Power, under which the U.S. would make available a grant of four hundred thousand U.S. Dollars ($400,000) for China's Tianshengqiao Hydropower Project (THP). The grant would be used for professional and technical services performed by a U.S. firm to assist the Ministry of Water Resources and Electric Power in carrying out a feasibility study and in providing guidance for preparation of tender documents for THP. In August of the same year, while visiting China at the invitation of the Ministry, the U.S. Army Corps of Engineers discussed issues related to the above-mentioned agreement and studied the location of THP.

From September 16-20, 1982, the National Coordinators from both sides met in Washington, reviewed the implementation of the projects listed in Annex One to the Protocol, expressed satisfaction at the progress achieved, and signed Annex Two. During these meetings both sides expressed their interest in having U.S. companies participate in the implementation of Chinese hydropower projects through commercial contracts.

Future Plans

The bilateral cooperation for 1983-84 is expected to make new progress. A U.S. firm will come to China to provide technical services for THP as specified above. Seminars between the U.S. and the P.R.C. on hydropower technology sales and on methods of financing large hydropower projects will be held in Beijing, and a U.S.-P.R.C. technical seminar on multipurpose river basin planning will be hosted by the Tennessee Valley Authority. Furthermore, exchanges of visits are scheduled by teams from the U.S. and the P.R.C. concerning the Three Gorges, Longtan, and Ertan projects to discuss related technical matters. The Chinese side will also send, for the first time, engineers to do professional work at appropriate organizations in the U.S.

11. EARTH SCIENCES

Achievements

The Second Meeting of the U.S.-P.R.C. Joint Working Group on Scientific and Technical Cooperation in Earth Sciences was held in Washington in October 1981. As a result of the meeting, Annex Three was concluded, which set forth seven cooperative projects for the first phase of implementation. Four of these projects are already underway.

In November 1982, the Third Meeting of the Joint Working Group was held in Beijing. The two sides reviewed the situation of the projects set forth in the Second Meeting which have been undertaken and were yet to be undertaken; discussed general timing and arrangements for implementaton in 1983; and, through consultation, decided on the projects that were to begin implementation in 1983 and thereafter. Both sides were pleased with the progress on the four projects already underway. In addition, the two sides exchanged views on measures for promoting project advancement, strengthening communications and contacts, and enhancing bilateral academic exchanges. An agreement in principle was reached at the meeting on Annex Four which was drafted by the Joint Working Group.

Future Plans

The Co-chairpersons of the Joint Working Group will sign Annex Four through correspondence. Collaborative activities under the 17 projects already agreed are expected to undergo rapid development. Following the Meeting of the Joint Commission, the Director of the U.S. Geological Survey will continue his visit to China as a guest of the P.R.C. Ministry of Geology and Mineral Resources.

12. EARTHQUAKE STUDIES

Achievements

All eight Annexes to the Protocol for Scientific and Technical Cooperation in Earthquake Studies have been undertaken. The Chinese side has completed the construction of West Yunnan and Beijing experimental sites for earthquake studies and scientists of both sides have conducted their research work in the field. Part of the equipment provided by the U.S. side, including strong motion accelerometers, geomagnetometers, seismic data processing equipment, etc. has arrived in place and some have been in operation. The two sides have obtained data reports on seismic, geomagnetic and gravity observations in the cooperative earthquake precursor projects.

U.S. and P.R.C. scientists have conducted investigations and research on geological structures and fault activity in West Yunnan, Shandong, and Ningxia in China, and the San Andreas fault of the United States. Strong ground motion instrument arrays have been installed in Beijing area and valuable acceleration records have been acquired in the vicinity of Tangshan. Probabilistic design models for earthquake resistant structures have been simplified and tested through utilizing the data collected by Chinese side. A new discriminating method of soil liquefaction has been put forward based upon Chinese experience. Projects are being carried out on bridges, reinforced concrete structures, arch dams and buried pipelines. Four workshops have been held to study earthquake hazard mitigation actions and to develop the discipline of earthquake engineering.

Future Plans

The representatives and coordinators on both sides will meet at an appropriate time to make an overall review and evaluation of the Protocol for Scientific and Technical Cooperation in Earthquake Studies and to discuss the program for the final year of the Protocol and cooperative prospects thereafter. The Chinese and U.S. sides plan and have discussed the development of a digital seismic information network in China, jointly conducted studies of rock mechanics, stress measurement, observation of crustal deformation, seismo-geochemistry, deep seismic sounding, seismic microzonation, seismic hazard estimation, seismic response of various structures and so on.

13. ENVIRONMENTAL PROTECTION

Achievements

In February 1982 the Chinese Academy of Medical Science received an epidemiologist from the Health Effects Laboratory of the U.S. Environmental Protection Agency, who subsequently worked for two months at the Academy's Institute of Hygiene. On September 5-12, the Chinese side hosted a group of three from EPA and the two sides exchanged views on the implementation of specific activities contained in Item A, Paragraph II, Annex One, and signed minutes of the talks. Recently, the two sides exchanged letters concerning the cooperative program under Paragraph C of Annex Three (modeling of air pollutant transport and transformation).

Future Plans

The two sides will conduct in the near future an epidemiologic study on the relation between air pollution due to coal combustion and lung cancer at Xuanwei County, Yunnan, the People's Republic of China. It is also anticipated that the two sides will begin joint laboratory and field studies in the Beijing-Tianjin area on the transport and transformation of atmospheric polutants.

14. BASIC SCIENCES

Achievements

The Second Meeting of the U.S.-P.R.C. Joint Working Group for Cooperation in the Basic Sciences was held in Washington in 1982. At that meeting the scope of the program was expanded to eleven areas of Cooperation in the Basic Sciences. The implementing agencies on both sides have so far approved 25 cooperative projects, which include five joint seminars, 19 collaborative research projects and one program development meeting. Three seminars have been held to date, namely in "Metallurgy," the "Beginnings of Metallurgy in China," and "Inorganic and Organometallic Chemistry." A program development meeting on "Heat Transfer" has also been conducted. Of the 19 collaborative research projects, 16 are under way while three were completed in 1982. The two sides expressed satisfaction at the smooth implementation of the cooperative program under the Protocol as well as the highly enthusiastic cooperation of the scientists of the two countries.

Future Plans

The two sides plan to hold two bilateral seminars in May 1983 on (1) Microstructure and Properties of Ceramic Materials and (2) Biomechanics. The Third Meeting of the Joint Working Group will be held immediately after the Meeting of the Joint Commission and the two sides will discuss the directions and prospects for enhanced cooperation. The two sides expect to further to expand the scope of activities under the Protocol and maintain the number of projects at approximately 30 per year.

Both sides consider that it is the common aspiration of both sides to maximize opportunities for scientists of the two countries to engage in mutually beneficial cooperation in the Basic Sciences.

15. BUILDING CONSTRUCTION AND URBAN PLANNING

Achievements

Implementation of the Protocol on Cooperation in the Field of Building Construction and Urban Planning Science and Technology is being undertaken by the U.S. Department of Housing and Urban Development and the P.R.C. Ministry of Urban and Rural Construction and Environmental Protection. A delegation led by Mr. Samuel R. Pierce, Secretary of Housing and Urban Development, visited China August 10-20, 1982. Both sides have agreed on the Annex to the Protocol.

Future Plans

In 1983 two delegations from China will visit the United States. A symposium on "Building Construction and Urban

Planning" will be held in China. Both sides will also begin to compile an English-Chinese and Chinese-English glossary on building construction and urban planning.

16. NUCLEAR SAFETY

Achievements

The Protocol on Cooperation in Nuclear Safety Matters was signed by the U.S. Nuclear Regulatory Commission (NRC) and the P.R.C. State Science and Technology Commission in Washington on October 17, 1981. In January 1982 the Chinese side sent a nuclear safety delegation to the U.S. In July 1982 a delegation of three persons headed by Victor Gilinsky, NRC Commissioner, visited China. Also during the year three members of the NRC staff individually visited China to lecture on reactor safety issues of mutual interest. These visits and the exchange of documents and the NRC safety computer codes provided for an active exchange of nuclear safety information between the two sides.

Future Plans

Future plans call for the continuation of the above cooperation and will include one-year technical assignments for several Chinese engineers involved in nuclear safety matters to work and study at NRC or appropriate NRC-contracted installations.

17. SURFACE WATER HYDROLOGY

Achievements

The Protocol on Scientific and Technical Cooperation in the Study of Surface Water Hydrology was signed on October 17, 1981, in Washington. From May to June 1982, a U.S. Geological Survey delegation visited China and held detailed discussions on annexes to the Protocol. Both sides agreed to sign the following Annexes:

(1) The interchange of scientific and technical information on hydrology and analytical techniques of water resources studies;

(2) hydrologic measurement procedures, instruments, and equipment; and

(3) hydrologic extremes.

The Parties will first sign the three Annexes mentioned above, and their implementation will begin this year. During April 1983, one USGS sediment expert also visited China in conjunction with a U.S. Department of Agriculture delegation to continue discussions of potential river sedimentation studies.

Future Plans

The two sides are also expected to exchange views on the following cooperative projects:

(1) Scientific and technical cooperation on hydrology in frigid zones (glaciology);

(2) collaborative research on river sedimentation studies; and

(3) Flood measuring and forecasting techniques.

SCIENCE AND TECHNOLOGY ACTIVITIES - GENERAL

The Agreement on Cooperation in Science and Technology calls for the Contracting Parties to encourage and facilitate development of contacts and cooperation among a range of entities, both public and private (Article Four). Accordingly, there has been a significant growth of activities which, while not under the aegis of any specific Protocol, contribute to the objectives of the Agreement.

The Commission is particularly gratified to note that the U.S. National Academy of Sciences and the Chinese Academy of Sciences have discussed, during this meeting, future cooperative programs under the guidance of the Memorandum of Understanding signed at this Meeting between them, and that the Memorandum of Understanding between the U.S. National Institutes of Health and the Chinese Academy of Sciences on Cooperation in Basic Biomedical Sciences will provide new opportunities to scientists on both sides to carry out scholarly exchanges.

The Commission is additionally gratified to note the progress achieved by institutions of higher learning of both countries in implementing existing agreements for scientific and technical exchange and in establishing new agreements. The two sides will continue to support and encourage such activities.

In view of the smooth progress of the Cooperation to date and of the fact that the Agreement between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology expires on January 31, 1984, both sides agreed to extend the Agreement by an exchange of notes to take place in Beijing through diplomatic channels.

It was agreed that the Fourth Meeting of the U.S.-P.R.C. Joint Commission on Scientific and Technological Cooperation will be held in the United States in the latter half of 1984.

Done at Beijing, on the Eleventh day of May of 1983, in duplicate in the English and Chinese languages, both texts being equally authentic.

Head of the U.S. Delegation

Head of the PRC Delegation

APPENDIX I

LIST OF THE U.S. DELEGATION TO THE THIRD MEETING OF THE U.S.-P.R.C. JOINT COMMISSION ON SCIENTIFIC AND TECHNOLOGICAL COOPERATION

U.S. Co-chairman

George A. Keyworth	Science Advisor to the President, Director of the White House Office of Science and Technology Policy

Members of the Commission

Frank Press	President, National Academy of Sciences
Edward A. Knapp	Director, National Science Foundation
John Byrne	Administrator, National Oceanic and International Administrator, Department of Commerce
James Malone	Assistant Secretary, Oceans and International Environmental and Scientific Affairs Bureau, Department of State
Alvin W. Trivelpiece	Director of Office of Energy Research, Department of Energy
Jack L. Kerrebrock	Associate Administrator for Aeronautics and Space Technology, National Aeronautics and Space Administration
James Wyngaarden	Director, National Institutes of Health
Ronald Trowbridge	Associate Director, United States Information Agency
Richard Douglas	Assistant Deputy Secretary, Department of Agriculture
Dallas Peck	Director, United States Geological Survey

Acting Executive Secretary

Lee M. Peters	Officer, Office of Cooperative Science and Technology Program, Department of State

Other Members

Donald Gregg	Assistant to the Vice President for National Security Affairs
Ronald B. Frankum	Deputy Science Advisor to the President, Deputy Director of the White House Office of Science and Technology Policy
John M. Marcum	Assistant Director, Office of Science and Technology Policy
Frederick N. Khedouri	Associate Director, Office of Management and Budget
Robert White	President-Elect, National Academy of Engineering
Charles Horner	Deputy Assistant Secretary for Science and Technology, Department of State
William T. Archey	Deputy Assistance Secretary for Trade Administration, Department of Commerce
Terry B. Kinney	Administrator, Agricultural Research Services, Department of Agriculture
Kenneth S. Pedersen	Director of International Affairs Division, National Aeronautics and Space Administration
Jack L. Gosnell	Chief, Science and Technology Office, U.S. Embassy to China

APPENDIX II

LIST OF THE P.R.C. DELEGATION TO THE THIRD MEETING OF THE U.S.-P.R.C. JOINT COMMISSION ON SCIENTIFIC AND TECHNOLOGICAL COOPERATION

P.R.C. Co-chairman

Fang Yi	State Councillor, Chairman of the State Science and Technology Commission

Members of the Commission

Zhao Dongwan	Vice-Chairman of the State Science and Technology Commission
He Kang	Vice Minister of the Ministry of Agriculture, Animal Husbandry, and Fishery
Yan Dongsheng	Vice President of the Chinese Academy of Sciences
Huang Xinbai	Vice Minister of the Ministry of Education
Zhu Qizhen	Assistant Minister, Director of the Department of American and Oceanian Affairs, Ministry of Foreign Affairs
Luo Yuru	Director of the National Bureau of Oceanography
Gao Zhenning	President of the Chinese Aeronautical Establishment
Deng Jiadong	Vice President of the Captial Medical College of China
Li Tingdong	President of the Chinese Academy of Geological Sciences
Tong Zhipeng	Deputy Chief-Engineer of the Ministry of Electronics Industry
Zhu Jingde	Deputy Director of the Department of Foreign Affairs, Ministry of Water Resources and Electric Power

Executive secretary

Shi Guangchang	Deputy Director of the Department of International Science and Technology Cooperation, State Science and Technology Commission

Other Members of the Delegation

Song Jian	Vice Minister of the Ministry of Astronautics
An Qiyuan	Director of State Seismological Bureau
Jia Weiwen	Commissioner, Director of the Department of Specially Promoted Projects, State Science and Technology Commission
Wu Mingyu	Commissioner, Director of the Department of Science and Technology Policy, State Science and Technology Commission
Wu Xing	Commissioner, State Science and Technology Commission
Li Shi	Director of the Department of Science and Technology, Ministry of Communications
Zhi Dexin	Deputy Director of the Technology Import and Export Department, Ministry of Foreign Economic Relations and Trade
Wang Gang	Deputy Director of the Bureau of Foreign Affairs, Chinese Academy of Social Sciences
Wu Yikang	Science Counsellor, P.R.C. Embassy to the United States
Zha Peixin	Deputy Division Chief, Department of American and Oceanian Affairs, Ministry of Foreign Affairs

Mr. HORNER. The Office of Science and Technology Policy is the official U.S. executive agent for the agreement, and the Director of the Office of Cooperative Science and Technology Programs in the Department of State is the U.S. Executive Secretary, and officers in that Office serve in effect as the U.S. Secretariat.

On the Chinese side, the executive agent is the State Science and Technology Commission and the Deputy Director of its International Affairs Department serves as the Chinese Executive Secretary.

Together, the two Executive Secretaries are responsible for the day-to-day management and coordination of activities, planning for meetings and facilitating the communications among participants on both sides.

On a day-to-day basis, the U.S. Executive Secretary and his office, which has a full-time China program officer, is in frequent contact with the Office of the Science Adviser, colleagues both on the China desk and in other bureaus in the State Department, and other personnel in the participating Federal agencies.

When warranted, meetings of the various technical agency representatives and relevant State Department officers are held.

That concludes my introductory remarks, Mr. Chairman. Again, I would like to express our appreciation for being invited here this morning.

Mr. SWIFT. Mr. Horner, thank you very much for your statement.

[The statement of Mr. Horner follows:]

STATEMENT BY CHARLES HORNER,
DEPUTY ASSISTANT SECRETARY OF STATE
FOR SCIENCE AND TECHNOLOGY AFFAIRS,
TO THE SPECIAL SUBCOMMITTEE ON U.S. TRADE WITH CHINA,
THE HOUSE OF REPRESENTATIVES,
OCTOBER 31, 1983

Mr. Chairman:

I appreciate this opportunity to discuss with the Subcommittee official scientific and technological cooperation with China. The US science and technology relationship with the PRC has grown steadily since the basic Agreement on Cooperation in Science and Technology was signed on January 31, 1979, four weeks after the normalization of diplomatic relations between the United States and the People's Republic of China. Actually, official S&T cooperation between the US and the PRC had begun several months earlier, with the signing of agreements in agriculture, space, and student-scholar exchanges in late 1978. Those agreements were then brought under the purview of the basic Agreement. Since then, additional protocols and understandings have been signed and there are now 21 implementing accords involving over a dozen US government agencies and covering an extensive range of scientific and technological subjects. A list of the protocols is attached.

The China program is today the most active bilateral S&T program the United States has. In the less than five years of the formal S&T relationship, close to 300 specific exchanges and projects, ranging from visits by individual scientists to major cooperative research projects in such areas as medicine and earthquake studies, either have been carried out or are in the process of implementation. In the first years of cooperation, much of the activity involved orientation visits, identification of appropriate counterpart institutions and scientists, and the planning of cooperative work. Since then more substantive projects have been undertaken.

A few examples will illustrate the scope of work under the Agreement. In seismology, there are significant projects of interest to scientists in both countries in monitoring earthquake phenomena and studying possible ways to predict earthquakes -- with important potential benefit in reducing death, injury and other damage. In the program administered by the Department of Agriculture, plant and animal germplasm are being exchanged, which can signficantly improve both nations' stocks, with benefits in terms of productivity and disease resistance. The comparative study of the climates and agricultures of the North China Plain and the North American Great Plains is a project which involves a number of scientific disciplines and is intended to enhance our understanding of the relationship between climate and crop production. In medicine, cooperative studies of cancer epidemiology hold real promise for gaining new insights into the disease, and an extensive joint project in heart research is just getting underway.

The S&T program receives the personal attention of senior officials on both sides, and affords the US excellent opportunities for frequent, positive contact with Chinese leaders at high levels. It fosters the rapid development of personal and institutional ties between the S&T establishments of the two countries, both within the framework of the specific protocols and in independent relationships between US scientists and their Chinese colleagues.

Non-official contacts are extensive. Scores of US colleges and universities have at least one formal cooperation or exchange agreement with an institution in China. Many have multiple ties and new relationships are continually being established. All of these relationships will continue to expand over the years as the large numbers of Chinese students and scholars complete their education and/or research in the United States. Currently, over 10,000 Chinese are studying in this country, about half of them sponsored by the Chinese government; the rest study under private auspices. About 80 percent of these students are studying in fields of science and technology.

In terms of our broader interests, the S&T program with China contributes to several US foreign policy goals. In encouraging the specific projects mutually decided upon by American scientific and technical agencies and institutions and their Chinese counterparts, the Department of State seeks to ensure that they also serve our broader national interests. Politically, the S&T exchanges add substance to the normalization process and, as noted, they help to expand relationships at senior governmental levels and between the scholarly and scientific communities of the two countries.

The United States benefits commercially from Chinese purchases of US technology and equipment that are an outgrowth of official cooperation in a number of fields. This is a logical consequence of such cooperation because the PRC's import policy is oriented largely toward the acquisition of technology and equipment from abroad, and some of the research projects expose the Chinese participants to American scientific equipment and the American approach to scientific research. Two examples are the purchase of components for the Beijing Electron Positron Collider facility, which is a subject of cooperation under the High Energy Protocol with the DOE, and procurement through the USGS of earthquake detection equipment. Other protocols, such as that on hydropower development, hold the prospect of larger contracts arising from feasibility studies on these major developmental projects. Article 4 of the 1979 basic S&T Agreement provides that both sides will promote, where appropriate, mutually beneficial economic activities.

The basic S&T Agreement of 1979 established the structure for directing and coordinating the S&T relationship between the US and China. This is the US-PRC Joint Commission on Scientific and Technological Cooperation, which plans and coordinates S&T cooperation, monitors and facilitates suchcooperation, and considers proposals for further cooperative activities. The Co-chairmen of the Joint Commission are, on the US side, the Science Advisor to the President and Director of the Office of Science and Technology Policy (OSTP), Dr. George A. Keyworth; and, for the Chinese, State Councillor (formerly Vice Premier) Fang Yi.

The Joint Commission has held three meetings, alternately in Beijing and Washington. The latest meeting was held in Beijing in May 1983, and the next meeting is presently scheduled for Washington in the Fall of 1984. The US delegation to the Joint Commission meetings includes senior officials from the various technical agencies which have protocols and understandings with the PRC. Among the delegates to the May 1983 meeting were the Director of the National Science Foundation, the Administrator of NOAA, the Director of the US Geological Survey, and the Director of the National Institutes of Health, all of whom participated in talks with leaders of Chinese counterpart agencies. Following an agreed agenda, the Joint Commission reviewed in detail progress in the S&T relationship, discussed program procedures and problems, and looked into further areas of cooperation.

The basic Agreement calls for executive agencies to oversee the on-going relationship and prepare for the Joint Commission meetings. The OSTP is the US Executive Agent for the Agreement. The Director of the Office of Cooperative Science and Technology Programs in the Bureau of Oceans and International Environmental and Scientific Affairs (OES/SCT) in the Department of State is the US Executive Secretary, with his office serving as the US secretariat. On the Chinese side, the

Executive Agency is the State Science and Technology Commission (SSTC); the Deputy Director of the Department of International Science and Technology of the SSTC serves as the Chinese Executive Secretary. Together they are responsible for the day-to-day management of the cooperation, coordination of the Joint Commission's activities, planning for Joint Commission meetings, and facilitating communications between cooperating technical agencies on the two sides. The Executive Agents coordinate closely to promote proper implementation of all activities and programs. This is accomplished by correspondence and periodic meetings.

In carrying out its primary responsibility of coordinating the S&T relationship with China on a daily basis, OES/SCT, which also has a full-time China program officer, is in frequent contact with OSTP and colleagues on the China desk and in other State bureaus and with the coordinators and other personnel in the participating technical agencies in regard to specific programs under the various protocols. When warranted, OES/SCT also convenes meetings of technical agency representatives and officers from other State bureaus to discuss programs, direction and priorities with respect to particular protocols or programs.

In concluding my remarks, Mr. Chairman, I would again like to express my appreciation for being invited here today. I will be pleased to answer any questions.

US-PRC SCIENCE AND TECHNOLOGY AGREEMENT AND IMPLEMENTING PROTOCOLS

Agreement on Cooperation in Science and Technology
(January 31, 1979)

Understanding on the Exchange of Students and Scholars
(October 1978) -- USIA

Understanding on Agricultural Exchange (November 1978) -- USDA

Understanding on Cooperation in Space Technology
(December 1978) -- NASA

Implementing Accord in the Field of High Energy Physics
(January 31, 1979) -- DOE

Protocol on Cooperation in the Fields of Management of Science
and Technology and Scientific and Technical Information
(May 8, 1979) -- USDOC

Protocol on Cooperation in the Fields of Metrology and
Standards (May 8, 1979) -- USDOC/NBS

Protocol on Cooperation in the Field of Atmospheric Science and
Technology (May 8, 1979) -- NOAA, NSF

Protocol on Cooperation in the Field of Marine and Fishery
Science and Technology (May 8, 1979) -- NOAA, NSF

Protocol for Cooperation in the Science and Technology of
Medicine and Public Health (June 22, 1979) -- DHHS

Protocol on Cooperation in Hydroelectric Power and Related
Water Resource Management (August 28, 1979) -- USDOC

Protocol for Scientific and Technical Cooperation in Earthquake
Studies (January 24, 1980) -- USGS

Protocol for Scientific and Technical Cooperation in the Earth
Sciences (January 24, 1980) -- USGS

Protocol for Scientific and Technical Cooperation in the Field
of Environmental Protection (February 5, 1980) -- EPA

Protocol on Cooperation in the Basic Sciences
(December 10, 1980) -- NSF

Protocol on Cooperation in the Field of Building Construction and Urban Planning Science and Technology (October 17, 1981) -- HUD

Protocol on Cooperation in Nuclear Safety Matters
(October 17, 1981) -- NRC

Protocol on Scientific and Technical Cooperation in the Study of Surface Water Hydrology (October 17, 1981) -- USGS

Protocol on Cooperation in Aeronautical Science and Technology (May 11, 1983) -- NASA

Protocol on Cooperation in the Fields of Nuclear Physics and Controlled Magnetic Fusion Research (May 11, 1983) -- DOE

Protocol on Cooperation in Science and Technology of Transportation (May 11, 1983) -- DOT

Memorandum of Understanding on Cooperation in the Basic Biomedical Sciences (May 11, 1983) -- NIH

Mr. SWIFT. I would like to ask fairly elemental questions both for the edification of the members of the subcommittee and the record.

Clearly, the State Department has the lead role in coordinating our activities and is, therefore, if I understand correctly, the lead negotiator as far as the specifics of a protocol are concerned. Is that correct?

Mr. HORNER. Specific protocols are negotiated by the representatives of the technical agencies concerned.

Now, under both law and in practice, specific agreements are reviewed by the Department of State both for conformity with overall national policy and with the usual international and diplomatic practices.

However, we do not make decisions regarding either the scientific merit or the management of any particular project. It has been our experience that the scientific and technological personnel themselves are the best judge as to how to proceed in any of these things, and we would not routinely second-guess them.

Instead, our interest is in insuring comformity with policy and assuring that that which is agreed to can be implemented and carried out.

Mr. SWIFT. Then is it correct to suggest that you help facilitate the negotiations, to set it up and get people in touch and let the agency involved do the essential negotiation, reserving the right to be sure that anything agreed to is consistent with our foreign policy?

Mr. HORNER. That is correct.

Mr. SWIFT. What role does State play if there are any misunderstandings or disagreements that develop between the parties under a protocol?

Mr. HORNER. Our basic role in such a situation is to help the representatives of the agencies involved, both on the Chinese side and on our own, to reach an understanding with respect to the points at issue.

Now, from time to time, there arise differences of interpretation of protocols, as to the division of responsibilities and commitment of resources.

Our relationship with other agencies of the Federal Government is not such that we are able to instruct them to resolve an issue one particular way. Nor are we in a position to make decisions for them that affect their own programs or their own budgets. Nonetheless, we try to be as persuasive as we can even though we do not exercise any kind of direct control over the operational aspects of any of these protocols.

Mr. SWIFT. A facilitating function as much as anything else.

One would assume that the key location of diplomatic talent in the U.S. Government would be in the State Department. I do know that there are some people with diplomatic training who serve in other departments. There are some in Commerce, for example, either on leave or transfer or so forth.

What is fairly typical? How often do other agencies have people with those particular skills and background knowledge to be able to do the negotiating for them? And how often, typically, does an agency need to rely on the State Department for some assistance in that regard?

Mr. HORNER. The people who actually operate and implement these programs in the technical agencies are individuals of some quite substantial international experience, and even of international standing. Almost all of our technical agencies and cabinet departments have had for many years extensive international programs and extensive international contacts. I think, therefore, they are quite skilled at the business of international science cooperation, and quite adept at it also.

I think that we have found that absent arcane questions of politics and questions of phraseology which in this relationship sometimes can be rather important, we don't really expect people to be expert in that kind of thing. But I think we do have in our Government substantial expertise in the management of international programs, especially with regard to China.

Mr. SWIFT. So the role you play in that kind of thing is not so much extending State Department expertise but rather the role of the lead agency, facilitating and trying to keep things going.

Mr. HORNER. And from time to time the reporting of our own representatives in China makes us aware of opportunities for cooperation or changes in Chinese interest we can then sometimes advise agencies in the Federal Government to explore these possibilities.

Mr. SWIFT. In negotiating these agreements with the PRC, what special problems have you incurred?

I am not asking for an encyclopedic list, but what have been the key kinds of problems that you run across?

Mr. HORNER. I would say in the first and most general sense, that we have to recognize that we are dealing with two different kinds of societies, differently organized, with rather different views of the relationship between the citizen and the state. And two governments also which are rather differently organized, two agencies which have different relationships, both politically, and so on. This is the first problem.

I think that one encounters how a society organized the way ours is or deals with a society which is organized the way that society is, there is always an assumption, I think, on the part of the Chinese that both individual citizens and parts of the Federal Government can exercise an authority over each other that sometimes is hard to explain that is not the case.

We also, from time to time, have to discuss U.S. constitutional procedures, the involvement of the U.S. Congress with respect to the appropriation of funds, first and foremost, but also with respect to various statutes that we have and statutory requirements that Federal agencies have to meet.

Sometimes we get the impression that our Chinese counterparts think that these matters are artificial barriers that we raise, but in fact we do have to explain to them about the budgetary process and we have to explain to them sometimes about various statutory requirements which govern all of our activities, both domestically and overseas.

Those, I think, are really the main barriers and obstacles and sources of difficulty and misunderstanding.

Mr. **Swift**. Those might cause generic problems given the two societies trying to work together and each not fully understanding the details and subtleties of the other system.

I would like to also address specific issues such as the patent issue. Is that a particularly troublesome issue? Is progress being made in that area?

Mr. **Horner**. It is an issue which we have had to address in different contexts and not all of the aspects of it have been resolved.

We concluded three new protocols with the Chinese at this last meeting in May. There were in each of those or at least in two of those serious discussion as to how the problem of intellectual property needs to be addressed.

We have under discussion draft agreement for cooperation in the field of telecommunications and that is also a question that needs to be resolved. Sometimes it has been possible to "agree to agree" later on some of these problems, but that is a difficult question. Once again, it does raise questions of law and it is almost a generic problem.

Mr. **Swift**. Well, I know that this committee or virtually all the members of this committee, when we were in China we would raise this issue and they would say, "We are working on that and we are making progress," and then they would come back to something we were not doing appropriately, often the technology transfer issue.

We have taken some very significant steps on technology transfer to China. The administration has really moved a great distance in that area. We have passed in the House just last week some considerable improvements in our law with regard to that.

So I think we can demonstrate some real progress in that area, which I hope could be pointed out to them, because I suspect one of the things that Congress and this committee will be particularly watching in terms of reciprocity is, are we making significant progress on these patent issues, which I think to the private sector is a very important opposite side to the technology transfer kind of issue.

I am not telling you anything you don't know, but I would like to put it on the record in case it is useful to show somebody something.

Mr. **Horner**. In fact our discussions on these and related subjects will benefit quite a bit from the fact that you have put it on the record.

Mr. **Swift**. The House has in fact, within the last several weeks, taken significant steps to be very supportive of the administration in moving in a direction that was sorely wanted by the Chinese.

I think Congress will also get very, very interested in this patent issue at some point. It may even be the issue, rather than some of the foreign policy implications, that could bring about an increased reluctance on the part of Congress down the line, if I have any sense of how this institution operates at all.

It may be a subtlety in our system that they may not fully appreciate. If we can help clarify that in our minds, it may be helpful.

One last question before I recognize my colleague.

Are there, of the various agreements and protocols that have been made, any that are not particularly successful at this point? And, if so, are there any things we can learn as to what has made them less successful than the others?

Mr. **Horner**. One is always reluctant to characterize some of them as more or less successful than others.

Mr. **Swift**. Let me turn the question around.

Have there been some that are particularly successful, and, are there some aspects to those that make them particularly successful?

Mr. **Horner**. I think that when there is a very clear understanding of costs and benefits, there is a much, higher probability of success. For example, when we are dealing in an area where the United States is in a strong position either of technical excellence, or, indeed, of unique scientific or technological capability in those areas where we are clearly perceived to be and are the world leader, if not a world leader, I think we have more success in those areas than we do in what one could term, even though I am reluctant to use the term, "softer disciplines" or "softer subjects."

We have had difficulties reaching an understanding with the Chinese about appropriate academic access for social scientists, and even in the field of environmental sciences, as you know, there have been difficulties.

It is my impression that when we are dealing with something—once again to use these terms—a bit harder, something where the U.S. position and reputation for excellence is unambiguous, we find it easier to deal with those kinds of subjects. I suppose that is what one would expect with respect to the calculation of what the mutual benefits are in each of these situations.

Mr. **Swift**. During our trip to China, Congressman Wirth raised the issue of limitations placed upon our social scientists and so forth. And the response was, "Well, what can you learn in a year that you can't learn in 3 months?"

It seems to me what you are saying is, where 2 and 2 makes 4, they know it, we know it, and it is easier to define those areas.

Whether you learn more in the additional 9 months of studying in the community or not is something that is much more difficult to prove. Is that an accurate understanding?

Mr. HORNER. That is part of it. But it is also the case that something that is very well defined, that is more easily compartmentalized, will have more appeal for the Chinese Government.

Mr. SWIFT. Do you feel that there is a sense that in some of the nonscientific, nontechnical, more humanities oriented areas of study that they may suspect we are trying to find out something other than just pure social science information? Is that part of the suspicion that clouds those things?

Mr. HORNER. I would just say that I think it is quite obvious that we have different views about freedom of investigation in the social sciences and in the humanities. I think that those are areas where the description of reality might lead to political judgments and might have certain political consequences.

Mr. SWIFT. So those sensitivities, which I think we can see, tend to make it more difficult to establish protocols in those areas than in a more clear-cut scientific or technical area?

Mr. HORNER. Those are also areas where they conclude that we have the greater interest and the greater incentive.

For instance, one should assume that if it somehow proves difficult to work out an arrangement whereby American social scientists have access to local society in China, the Chinese will not be overly distressed by failure to conclude such an arrangement. It is a question where they, it seems to me, feel that they are burying costs, whether they are symbolic costs or political costs or something which is at variance with their traditional practices. I don't think they will feel a great sense of loss.

But in some of these other areas, where they perceive more immediate, more practical, more tangible benefit, I think perhaps their attitudes are different. One can see that also in the workings of various of the protocols. That is not surprising. It is more or less what you would expect.

Mr. SWIFT. The gentleman from New York?

Mr. LENT. Thank you, Mr. Chairman.

Mr. Horner, in your testimony you indicate that as of now, there are 21 implementing accords involving over one dozen U.S. Government agencies.

Let me ask you something. How is each agency's participation in protocol activities funded?

Mr. HORNER. Generally speaking, technical agencies don't maintain a separate fund or a separate budgetary item for something called "international cooperation." When they participate in international programs, they are obliged to do so in support of the domestic policy objectives which are spelled out for them in their own organic legislation. So the funding is, in fact, an adjunct of the domestic program. I know of no agency that has a separate item called China.

Mr. LENT. Has it been considered or has any effort been made by State or the Office of Science and Technology Policy to request a specific commitment of funds for this overall program or to seek specific commitments from each agency involved?

Mr. **Horner**. It has been our feeling, and I know the feeling of the White House, that programs improve when they emerge from a competitive process within the agencies with respect to priorities. Therefore, we know that any program, be it with China or any other country, that one of the agencies involves itself in is almost by definition a good and sound program because it has survived an internal review, an internal study such that the management of the agencies know and understand that this particular international program is in fact of direct benefit to them and it is not something done merely for some cosmetic reason or merely to demonstrate that there is science cooperation with China.

Mr. **Lent**. Let me ask it this way: Under the science and technology agreement of 1979, what are the steps, very briefly, that an agency must take to initiate a new protocol?

Mr. **Horner**. If an agency of the U.S. Government which does not now have a protocol with China finds that there are things that it has reason to believe that there are things that you can usefully do with the Chinese, they might approach us and ask to be placed in contact with the appropriate Chinese agency to assess what the degree of interest is on the Chinese side. We are always happy to do that.

Mr. **Lent**. So the impetus then comes from the agency rather than the State Department?

Mr. **Horner**. Well, it can. We are also sometimes able to identify things which are either brought to our attention directly or things which we come upon in the ordinary course of business so that we are in a position to suggest to both sides what might be some useful areas.

Mr. **Lent**. Maybe you could give us an example. What you are saying is that sometimes the impetus comes from the agency and then to a certain degree, at least, the State Department encourages agencies to seek out new areas for cooperative activities with China and perhaps other countries as well.

But can you give us an idea of what new kinds of programs are being discussed or have been discussed in recent months so we have a little bit of a better grasp of this?

Mr. **Horner**. For example, during this year, a fair amount of the attention was devoted to concluding a protocol for cooperation in the field of telecommunications with the Chinese. This is something that has occurred to both of us, and it is a natural part of what the Chinese call their modernization program.

We have had visits to China by two delegations, one led by the Deputy Science Adviser and one led by the then Assistant Secretary of Commerce for Telecommunications, the idea being to identify potentially productive areas and to see whether or not we could reach an agreement on them.

Now, we have reached the point where we have made some textual suggestions to the Chinese which they are now considering. Meanwhile, as an adjunct to some of these other protocols, new subject matters will almost naturally present themselves. These are constantly being examined in the counterpart groups themselves in these various areas.

Mr. **Lent**. When something like this comes up, do you have some mechanism, perhaps, for coordinating these new ideas with existing efforts?

Mr. **Horner**. Oh, very definitely.

Mr. **Lent**. I have no further questions, Mr. Chairman.

Mr. **Swift**. Thank you very much, Mr. Lent.

Following up on the line of questions of the gentleman from New York, I can understand that the State Department has some difficulty in assuring adequate funding in other agencies. We in the Congress are not ignorant of territoriality and the problems that we call jurisdiction and the problems that can cause.

On the other hand, is the lead agency working with some agencies that quite rightly see their primary mission as domestic rather than foreign but who contain the expertise to participate usefully in a protocol? What are the mechanisms by which you can make an agency aware of opportunities that it might not see on its own and what ability do you have as the lead agency to encourage adequate funding for them to participate in these?

Mr. **Horner**. Well, I suppose we like to feel that we have friends in high places. We have found that oftentimes in these international matters the strong backing of the White House and of the Office of the Science Adviser, especially in conveying to the agencies the strong interest of the President in these activities, especially with China, more often than not are extremely persuasive in convincing people that they might devote some of these resources to these particular projects.

The division in which I am involved in the Department of State has activities of this sort with about 35 countries. Frankly, it is easy with China because there is, first of all, a lot of interest in the agency. Second, there is an awful lot of respect for the capabilities of individual Chinese scientists. And third, there is a general awareness of the importance of this activity to the country as a whole.

So we really have not had what I would call major difficulties in getting very good cooperation from individual agencies with respect to China.

I think just as it is the most conspicuous of the intergovernmental agreements we have, I think that when individual agencies are very pleased to be able to do something in China or with Chinese, when the opportunity present itself sometimes with other countries, it is a problem.

Mr. **Swift**. Ones that are less focused and are not as essentially right at the moment.

Mr. **Horner**. Sure.

Mr. **Swift**. How do you go about encouraging private sector participation in the protocols?

Mr. **Horner**. We have done this in different ways. We have attempted to have as one of the members of the joint commission on the American side, a representative of what one might call the private sector in science and technology, usually a research and development person but someone associated with one of our major corporations.

Second, I think that as these relationships expand and develop, it becomes apparent to the Chinese that what we consistently say about the United States is true, which is that as much as there is extraordinary expertise in the Federal Government in this area, in fact our own private sector is really an enormous repository not only of research experience but the actual technology in which they are interested.

We sometimes have difficulty, or at least at the beginning had difficulty, explaining that the U.S. Government is not of itself the source of industrial technology, nor can it persuade any particular corporation to make its industrial technology available, save when it wants to and at a price which it considers fair and under circumstances which it considers good for this. You have pointed that out in the context of national property, intellectual property rights, for example, so it has been our experience that there is an almost natural continuum that leads to the American private sector as these projects go in different areas.

As soon as the Chinese begin to develop an interest in translating research into actual acquisition of technology for some useful purpose, then it really becomes necessary for them to become involved with the private sector. We ourselves and our colleagues from the Commerce Department try to acquaint our corporations with the opportunities that are presented by this kind of cooperation.

Mr. **Swift**. Does there seem to be any benefit to us to have our private sector involved in some of the processes as well in order that they learn what we were referring to earlier as the generic problems?

I still hear—and I must admit, these are not some of the more sophisticated companies that have been doing a lot of work—but I still hear American industry, fairly important industry who talk about China in ways that seem a little unrealistic. In terms of Chinese decisionmaking, they are a little surprised to find that you can't sit down at the table and hammer out a deal like we do here and walk away in the same fashion.

One last question. The whole question of feasibility studies—and we will be bringing this up several times today in different contexts. It seems to me that if we participate in the feasibility study of some specific Chinese project, there are some long-term benefits that accrue to us.

What is the State Department able to do to encourage appropriate agencies to look favorably and optimistically and with some enthusiasm upon feasibility studies under the protocols?

We get back to the funding process again. How do you encourage them to spend the money necessary to be able to participate?

Mr. **Horner**. Well, we have consistently made the case that implicit in many of these activities are very significant opportunities for U.S. trade and commerce, especially in exports of technology, but other things too.

From our point of view, it is a problem or an obligation, really, to impress upon the interested agencies the importance to the United States as a whole of this program, where it fits into our overall foreign policy, what its potential benefits are to U.S. exports and U.S. economy generally, and to hope that they will perceive the significance of it in the same way that we do. That has been our experience, that in general that is the way it happened.

There is no doubt that from time to time people in the various departments and agencies find themselves having to compete for agency resources with colleagues in their own agencies for other programs and other parts of the world, and we find that that for us is an extremely difficult situation for us even to involve ourselves in, let alone really influence in any useful way.

I think in this sense we try and make the case. And we like to think that the strength of the argument speaks for itself, and in many cases it does.

Mr. SWIFT. I want to thank you.

I suppose I will make a specific comment, which is not aimed directly at you but anyone who is listening. But we did bring up the topic of telecommunication and the initiatives that the administration has made in that regard.

One of the things that we found on our trip was that the United States, in fact, has something unique to offer in telecommunications. We are the only industrialized nation in the world that has integrated both the production of the equipment for the research and the delivery of the services all in one.

When you are coming from where the Chinese are, which is virtually to move from very elemental telecommunication services to 21st century services that will provide for sophisticated data transmission and the whole works, we probably are uniquely qualified to offer them planning and design service that will enable them to put such a modern system in place at the absolute minimum of cost.

We found that the officials with which we met were very responsive to that point. Some of them, I believe had not really put that together before or had not been told that before, and it seems to me we have a unique opportunity for a very successful relationship with China in the area of telecommunications.

I am happy to see the administration pursuing that.

Mr. HORNER. Just to add, we think that that is absolutely correct. We recognize that it is an important challenge to our telecommunications companies to understand this that particular opportunity is there and for them to become sufficiently interested in it to compete aggressively for it.

I don't want to go beyond and intrude into perhaps areas where the State Department perhaps ought not to go, but the Government makes available encouragement and access and support and help to the U.S. private sector in many ways, but in the final analysis, this is something which they must do for themselves. It is an opportunity which they must perceive, and it is they who must win the commercial struggle with other potential suppliers. By making the case, we believe that they will do that. But in the final analysis, it is they, themselves, who must do it.

Mr. SWIFT. I thought it was a pretty good transition comment between State and Commerce.

Do you have any further questions?

Mr. LENT. No, sir.

Mr. SWIFT. If you don't mind, Mr. Horner, we would appreciate it if you could stay through the testimony and hear the next questions, because there may be some interrelationships we would like to explore.

[The following information was submitted for inclusion in the record:]

United States Department of State

Washington, D.C. 20520

BUREAU OF OCEANS AND INTERNATIONAL
ENVIRONMENTAL AND SCIENTIFIC AFFAIRS

Dear Mr. Chairman:

Thank you again for the opportunity to appear before your subcommittee on October 31, 1983. I am enclosing with this letter the responses you requested to 10 additional questions on the U.S-China science and technology protocols.

Please do not hesitate to call upon us for additional information on the extensive scientific and technological relations that are being developed with China.

Sincerely,

Charles Horner
Deputy Assistant Secretary for
Science and Technology

The Honorable
Al Swift,
Chairman,
Special Subcommittee on U.S. Trade with China,
House of Representatives.

1. Q. What role does State play in obtaining export licenses for equipment required under the protocols?

A. The individual agencies that are parties to the protocols are responsible for applying for an export license or ensuring that a supplier does so. For most scientific equipment, these licenses must be obtained from the Department of Commerce under the Export Administration Regulations. However, State plays a prominent role in inter-agency review of applications when that is required, as it does for other export requests for China. State is also responsible for obtaining COCOM clearance of certain higher level exports. Should problems arise with specific license requests, State assists the individual agencies in ascertaining the status, attempting to resolve any unnecessary delays, and ensuring that the licensing decision supports overall U.S. policy objectives.

2. Q. As you noted in your prepared statement, some 10,000 Chinese students are here in the U.S. Does State coordinate their visits? Can you provide any information on the academic disciplines these students are pursuing?

A. The Department of State does not coordinate the visits of these students as such. Arrangements for study are usually made directly between the student, the sponsor (whether the PRC or a private person or entity), and the educational institution. USIA does coordinate the selection and facilitate the placement of the Chinese under the Fulbright program, who currently number 10 students and eight scholars. By operating regulations, the State Department is required to give clearance before visas are issued to officially sponsored Chinese students and scholars. Approximately one half of the 10,000 students are officially sponsored by the PRC and enter on J-1 visas. The remainder are privately sponsored and are given F-1 visas. In all instances, the applications are carefully scrutinized to ensure that they meet statutory requirements for the requested status.

As noted in our prepared testimony, about 80 percent of the Chinese students pursue courses of study in the sciences. This estimate is in line with the survey of exchanges from 1978 to 1981 conducted by the US-China Education Clearing House. This survey also indicated that, particularly among the graduate students and scholars, the predominant courses of study were in mathematics and physical sciences and in engineering. The Committee on Scholarly Communication with the PRC (CSCPRC), with funding by USIA, is undertaking a more comprehensive survey of US/China academic exchange which is scheduled for completion in the first half of 1985.

3. Q. Some of the first protocols are scheduled to expire in 1984. What role will State play in negotiations to renew these accords or to modify, clarify, or expand their scope?

A. The State Department is already discussing renewal of the protocols with the USG agencies concerned and with the Chinese. Where neither side sees need for substantive revision of a protocol, the Department will prepare the proper documentation for a simple extension and will coordinate all required clearances. Simple extension is typically effected by an exchange of diplomatic notes or letters.

If amendments to the agreement are considered necessary, the Department will coordinate the US position with the concerned agency. In such instances negotiations on the amendments are often conducted through the Science Office of our Embassy in Beijing. In other cases, the relevant agencies on both sides may undertake the negotiations directly during visits or annual working meetings. The results of such negotiations are subject to the interagency approvals required by law and regulation. The Department coordinates such clearances.

4. Q. Could you identify and describe current efforts to negotiate new protocols? Please provide a step-by-step account of State's role in initiating, conducting and concluding negotiations for a new protocol.

A. The drafting of a new protocol may be initiated in a number of ways. It may be suggested by the Department of State or by the PRC's State Science and Technology Commission or by a specific ministry or agency on either side. Drafting a protocol is far from being the first step in the process however. Typically, some interest in greater cooperation develops within the relevant sectors of the scientific communities of both countries, and then there is consideration given to ways to effect it. Sometimes the project is appropriately a matter for the private sector, including the universities, and it is pursued in private channels. On other occasions, the project would reasonably involve U.S. Government agencies or laboratories. In that case we encourage an exchange of visits by working scientists and administrators to sound out further the interest of both sides in cooperative projects and to identify appropriate counterpart laboratories and scientists.

If informal consultations indicate sufficient interest on both sides, the concerned agency prepares a draft protocol. After fully clearing it through its own agency or parent department, as its own regulations may require, the agency submits the draft to the Department of State which initiates two actions. It circulates the draft within the Department and to other interested agencies, including OSTP and OMB, for comment and clearance. It also prepares the documentation required for authority to negotiate the protocol with a foreign government or agency.

Once authority to negotiate is approved and the draft is fully cleared or amended to meet the comments of other interested agencies, the draft protocol is transmitted to the Chinese for their comments. Most protocols go through several drafts to accommodate the interests of both sides. The response to Question 8 further discusses State's coordinating role in the negotiating process.

Two proposed protocols are currently being negotiated: one in telecommunications between the NTIA of the Department of Commerce and the PRC's Ministry of Telecommunications. We are awaiting Chinese response to a US-prepared draft which was sent to them some months ago. The Department of Energy and a number of Chinese agencies have been discussing a protocol in fossil energy. We are in the process of reviewing and circulating for clearance a DOE-prepared draft.

A number of other possible protocols have been discussed informally with the Chinese in the past few years These discussions have not gone further as yet, however, either because the Chinese have not expressed a strong interest or because a U.S. agency proposed protocol has not yet been fully cleared within the US government.

5. Q. There are three signed accords which do not appear on the list submitted as part of your statement: one with the National Academy of Sciences, one with the Smithsonian Institution, and a third with the American Nuclear Society. Are these outside the 1979 umbrella agreement?

A. Yes, these are outside the Science and Technology Agreement; they all involve private American institutions rather than US government agencies. The National Academy of Sciences, although operating under a congressional charter, is a private organization. The Smithsonian Institution is a trust establishment created by Congress and managed by an independent Board of Regents. The American Nuclear Society is a private organization consisting of individuals and companies with an interest in nuclear power.

It should be noted that a great many private American organizations, especially universities, have institution-to-institution agreements with Chinese counterparts.

6. Q. How does State monitor the protocol activity to ensure that the U.S. does not violate international agreements, such as the Nuclear Non-Proliferation Treaty?

A. OSTP and the Department of State require that all substantive communications on protocol activities be transmitted through State Department and Embassy Beijing channels. This enables the Department to monitor all activities to ensure that they are not in conflict with official policy or in violation of international commitments.

We should note that USG technical agencies working in sensitive areas are well informed of the legislative and treaty limitations on their cooperative activities. In regard to proposed activities in possibly gray areas, they usually seek the counsel of the Department of State before undertaking any commitment.

7. Q. Does your office (or another in State) monitor science and technology agreements that the Chinese might have with other nations? If so, could you arrange to brief the Subcommittee on these arrangements?

A. Department of State officers monitor Chinese S&T relations with other nations to only a limited extent. Other government agencies also watch for developments within their spheres of interest. Within the Department, OES/SCT is the focal point for questions on this subject, and we seek the assistance and expertise of other offices and agencies as appropriate.

We would be glad to arrange a briefing of the Subcommittee.

8. Q. Some agencies have been experiencing difficulty in negotiating a satisfactory patent clause in their newest protocols. Could you please provide a detailed outline of how State coordinates agency negotiations on patent issues? In this context, could you provide a detailed review of State's role in negotiating the patent language in the National Science Foundations protocol and how State coordinated with other agencies regarding that language?

A. First we would note the negotiation of satisfactory patent clauses has been one of the more difficult negotiating problems with most of the protocols from the beginning, not simply with those most recently signed.

In general, the Department's role in coordinating agency negotiations on patent (and other) issues, is to point out to the concerned agency the perceived problems and difficulties, if any, with the language being proposed. State does recognize, in so far as it does not contradict foreign policy directives, that the individual agencies, particularly in highly technical areas, are the best judge of what is acceptable in areas such as the protection of intellectual property rights.

Additionally, the Department attempts to ensure that language on a particular issue, which is agreeable to one agency, does not create problems for another agency which may be negotiating a similar agreement. In making its determination, the Department considers whether the areas of proposed activity of the two agencies are of sufficient similarity to require consistency of language on such subjects as patent protection. In some cases, the issue of patent protection is unlikely to arise in the lifetime of the agreement and therefore may be treated in more general language. In others, protection of the rights in question may be crucial to the successful functioning of the agreement.

The Department of State coordinated with NSF on the patent language for the annex to the National Science Foundation's protocol with the Chinese Academy of Sciences. There was at that time no perceived need for coordination on patent language with other agencies as the Chinese then apparently accepted the view that patent clauses would be tailored to the various substantive requirements of each protocol. Since then, the Chinese have sought to establish the NSF language as precedence for all agreements, and therefore, the Department has increased its coordinating effort among the agencies negotiating similar clauses on this subject.

9. Q. Could you please provide a detailed analysis of expenditures by the Department of State under the 1979 Science and Technology Agreement with China?

A. There is no separate budget for China S&T expenses within the Department of State's financial accounting structure. The Department does not fund S&T research activities with China; the Department's expenses are concerned with the management and coordination of the Government's S&T relations with the PRC. Therefore, the bulk of expenditures are contained in the general Salaries and Expenses appropriation. However, since these expenditures are widely dispersed among the various bureaus of the Department, a compilation and detailed analysis of total expenditures would be an extremely difficult undertaking.

Personnel involved in the US-China S&T program in OES's Office of Science and Technology Programs (OES/SCT) include one full-time program officer and portions of the time of the Office Director, who is the U.S. Executive Secretary, the Deputy Office Director, and one secretary. The Assistant Secretary, the Deputy Assistant Secretary for Science and Technology, and personnel in other offices in OES also spend time on the China program, as do officers in other bureaus of the Department, particularly EA, as specific cooperative policy, issues and activities warrant.

10. Q Could you please compare State's role under the bilateral science and technology agreements with Yugoslavia and China? Also, would you provide a detailed analysis of State Department expenditures under the agreement with Yugoslavia?

A. The role of the Department of State under the bilateral science and technology (S&T) agreement with Yugoslavia is quite different from that under the agreement with China. The former, signed in 1980, succeeded an earlier agreement dating from 1973. Under the current U.S.-Yugoslav agreement, the Department of State is responsible for contributing, over the five-year life of the agreement, up to $7,000,000, mainly in Yugoslav dinars, to a U.S.-Yugoslav joint fund for S&T cooperation. State staffs the U.S. side of the U.S.-Yugoslav

Joint Board on Scientific and Technological Cooperation, which administers the fund and generally guides the conduct of cooperative research. (The U.S. members of the Joint Board are a deputy office director in State's Office of Cooperative Science and Technology Programs and the Science Attache at the American Embassy in Belgrade.) State also provides oversight of and policy guidance to the U.S. technical agencies which manage the actual research projects and, of course, works with OMB and Congress throughout the year with respect to the authorizations and appropriations needed for the line item in the Department of State budget which pertains to the U.S.-Yugoslav S&T agreement.

Each year the Yugoslav side matches, in dinars, the U.S. contribution to the joint fund. OES, in consultation with the Comptroller's office at State, then allocates this pooled money to some eleven research areas by notifying participating U.S. technical agencies of the percentage of the whole amount each can count on for its ongoing and prospective cooperative research projects. At the semi-annual meetings of the Joint Board, the agencies, with State advisors, negotiate with the Yugoslav delegation on which projects in a particular research area should be funded and in what amount. The U.S.(State Department) members of the Joint Board then meet with the Yugoslav side to approve formally the funding for each project.

Between Joint Board meetings, the Department of State's role covers both operations at State in Washington and those at the Embassy in Belgrade. In Washington, OES, with the assistance of the Comptroller's office, helps technical agencies manage their programs by providing advice, ruling on questions of policy and practice, and facilitating communications with the Embassy in Belgrade and the agencies' Yugoslav counterparts. Embassy

Belgrade provides liaison with the Yugoslav side at federal, republic, and local levels as well as administrative support for the many research scientists and occasional program managers visiting one country or the other. OES and the Science Office at the Embassy are in constant, close, communication, and they coordinate together both the U.S. position when dealing with the Yugoslav side and the necessary administrative guidelines when assisting the U.S. technical agencies.

As mentioned above, the Department of State is responsible for providing the U.S. share of the joint fund. In FY-1983, State expended the entire appropriation of $1,700,000 for U.S.-Yugoslav S&T cooperation by contributing that amount to the joint fund bank accounts. Other expenses which State incurred in fulfilling U.S. obligations under the 1980 agreement are indirect and relatively small. We estimate that, in OES, 10% of the time of one officer (the Joint Board member) and 25% of another (the staff support officer) are spent on the Yugoslav program; in the Comptroller's office, perhaps 10% of one officer's time is similarly engaged. At the Embassy in Belgrade, the Science Attache and his Yugoslav assistant work nearly full time on this program, and the majority of the time of a Yugoslav budget assistant is spent on the Embassy's S&T accounts. The cost to the State Department of the two Joint Board meetings in 1983 did not exceed $1,300, most of which represents the cost of one round trip by air to Yugoslavia for the annual meeting in that country. Out-of-pocket representational expenses for the State employees in connection with the meetings probably did not exceed $400 total.

Attached are (1) a copy of the latest annual report of the U.S.-Yugoslav Joint Board, which summarizes the activities of the Board, including project funding, and (2) a listing which was prepared for another Congressional hearing earlier this year of U.S.-Yugoslav S&T projects, arranged by U.S. technical agency.

ATTACHMENT 1

ANNUAL REPORT
OF THE JOINT YUGOSLAV - U.S. BOARD ON SCIENTIFIC AND TECHNOLOGICAL COOPERATION FOR THE PERIOD OCTOBER 10, 1981 TO OCTOBER 8, 1982

TO

THE DIRECTOR OF THE FEDERAL ADMINISTRATION FOR
INTERNATIONAL SCIENTIFIC, EDUCATIONAL, CULTURAL
AND TECHNOLOGICAL COOPERATION OF THE SOCIALIST
FEDERAL REPUBLIC OF YUGOSLAVIA

AND TO

THE SECRETARY OF STATE OF THE UNITED STATES OF
AMERICA

This ninth annual report is submitted in compliance with article VI of the agreement between the Government of the United States of America and the Government of the Socialist Federal Republic of Yugoslavia on scientific and technological cooperation, signed on April 2, 1980.

It describes the activites of the Joint Board under this Agreement, including cooperative projects approved by the Board.

The 1973 Yugoslav/U.S. Agreement

Under the 1973 Agreement, through October 1982, the Joint Board approved 173 projects, of which 150 were supported by direct deposits and 23 from interest earnings. Decisions by the Joint Board bring the total cumulative funding approved from direct contributions to 285,098,854.67 dinars and authorized disbursements to 271,468.565.97 dinars. In addition, the total of 17,534,705.00 dinars from interest earnings has been allocated and 16,353,729.00 dinars has been authorized for disbursement through October 1982.

The 1980 Yugoslav/U.S. Agreement:

Through September 20, 1982 the total U.S. contribution to the Joint Fund under the 1980 Agreement was 131,956,500.00 dinars, and Yugoslavia had also contributed 131,956,500.00 dinars.

Each side plans to make deposits to the value of U.S.$1.7 million, either in dollars or the dinar equivalent.

Under the 1980 Agreement, the Joint Board has decided to fund 134 projects and allocated 339,783,100 dinars for that purpose.

The Yugoslav/U.S. Joint Board has focused its attention on the 1980 Joint Fund. During the reporting period the Board approved 34 projects having mutual benefit to both sides and substantial technical merit.

The Board addressed a number of procedural and other problems and made considerable progress in developing solutions for them. Such efforts will continue.

The Board expects to approve additional projects in the next year and has begun discussions on continuing cooperation beyond the 1980-84 Joint Fund.

APPROVED BY THE JOINT BOARD

LINWOOD R. STARBIRD
CHAIRMAN
OF THE YUGOSLAV/U.S. JOINT
BOARD

Zagreb, October 1982,
Yugoslavia

ATTACHMENT 2

Hearings
Committee on Appropriations, House of Representatives
Subcommittee on the Departments of Commerce, Justice,
and State, the Judiciary, and Related Agencies
March 22, 1983

UNITED STATES-YUGOSLAV PROJECTS CURRENTLY UNDERWAY DURING FISCAL YEAR 1982

A total of 117 joint U.S.-Yugoslav research projects were currently underway in fiscal year 1982. The major participants on the U.S. side were the Department of Agriculture (29 projects); the National Bureau of Standards (29 projects), the National Science Foundation (23 projects) and the Department of Health and Human Resources (15 projects). Other U.S. agencies taking part in the program include the Department of Energy, the Bureau of Mines and Geological Survey of the Department of the Interior, and the Environmental Protection Agency.

DEPARTMENT OF AGRICULTURE

Breeding Maize for improved Protein Quality and increased Oil Content.

Crop Yield-evapotranspiration and Yield-Water Application Relationships for Irrigation, Planning, and Management.

Evaluating Wheat Cultivars for Resistance to the Seen Pest in Yugoslavia and Incorporation of Resistance in Germplasm for Use in small Grains Breeding Programs in the United States.

Factors of Incompatibility between European Black Pine and Scotch Pine and Possibilities of Mass Production of their Hybrids.

Respiratory Diseases of Young Cattle.

Integrated Control of plant parasitic Nematodes.

Selection of superior indigenous Ecotypes of the Prunus and Purus Species (Plum and Pear).

Production of Fasciculate Forms of Pepper with Fruit which can be easily separated from their Calyxes.

Application of an Inbred Line of the Gypsy Moth for Biological Control of the Pest.

Evaluation of the potential of Superior Wild Hops *Humulus Lupulus* in Yugoslavia.

Insect Infestation on Stored Soybeans.

Use of Cellulolytic Fungi for Bioconversion of Food Processing Wastes.

Prevalence, Pathogenesis, Prophylaxis of Procine Parvo Virus (PPV)-induced Reproductive Failure of Swine.

Exchange of scientists in order to develop priority Research Projects in such fields as Food Technology and Forestry.

Biological control of insects and weeds.

Plant parasitic nematodes in vineyards in the territory of Slavonija and Baranja.

Advanced evaluation of new aromatic hop varieties for high resistance to downy mildew.

Breeding new varieties of Broomcorn resistant to Fusarium and Anthracnose.

Short Rotation Poplar Biomass Production.

The development of immuno-diagnostic tests for selected helminthic Parasites.

Complex Study of Herbicides in Maize, Sunflower, and Soybean Crops.

Biodegradation of Ligno-Cellulose Material by means of mixed Culture of Microorganisms.

Forming, Investigating, and Exploiting Gene Banks (Germplasm for important Agronomic, Morphological, and Physiological Characters at Wheat Species *T. Aestivum* esp., *Vulgare*).

Effects of Crossbreeding Different Breeds and Lines of Pigs on increasing Production of Pork.

Isozymes as Markers of Genetic Diversity in Higher Plants.

Development of Computer Programs for Evaluation of Different Agrohydrological Problems.

Contribution to Knowledge of Diagnosis, Epizootiology and Pathogenes of Listeriosis of Cows.

Screening for Sources of Disease Resistance in Wild Sunflower Forms in order to create resistant Hybrids.

Investigation on the Possibility of Control of the most harmful Noctuids on cultivated Plants Using specific micro-biological Preparations.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Health Effects Studies of People working in a Coal Gasification Plant.

Comparison of Iodine 123 and Technetium-99 as Imaging Agents for Thyroid Studies.

Neurotransmitters and their Metabolites: biochemical approach to Neuropsychiatic Disorders.

An Epidemiological Study of Secular Trends in CHD Risk Factors.

Study of Breast Cancer in Reference to Oral Contraceptive Use.

Prevention of RH Sensitization with RH IgG in Serbia.

Histogenesis and Differentiation of the Cerebral Cortex.

Experimental analysis of early rodent Embryos.

Physico-chemical Aspects of Urinary Stone Formation.

Molecular and cellular Basis of the Anemia Syndrome in Belgrade b/b Rats.

Clinical, experimental and organizational Aspects of bone marrow Transplantation.

Biological effect of Diagnostic Ultrasound.

The Synthesis of plasminogen Activator by cycling normal and transformed Cells in Culture.

The Research of potential Toxicity of some mycotoxins in the area where Balkan endemic nephropathy is widespread.

Correlation between the Malignant Cell Differentiation and Spread of Ovarian Cancer in Response to Multiple Cytotoxic Drug Therapy.

DEPARTMENT OF TRANSPORTATION

Development of strength in cement.

Design Criteria and Predictive Techniques for Embankments on Soft Soils.

DEPARTMENT OF ENERGY

Study of Defects in Materials of Interest for Solar Cell Energy Conversion.

Investigation of Resonances in Nuclear Reactions induced by heavy Ions.

P – PNN – Silicon Solar Cell.

Molten Salts used in Energy Storage, Conversion, and Conservation.

Utilization of Solar Energy and Wind Energy for Autonomous Electric Power Sources.

Feasibility Study of a Solar Thermo-Power Plant in Macedonia.

Photochemical Conversion of Solar Energy into Molecular Hydrogen.

Robust Decentralized Control of Electric Power Systems.

Environmental Protection Agency

Study on Pollution and Management of the Environment in Urban Areas—Sarajevo.

Health Effects of Pesticide Exposure.

Health Effects of Industrial Aerosols.

Digitalization of Infrared Spectra for Computerized Information Systems.

Department of Interior

BUREAU OF MINES—GEOLOGICAL SURVEY

Improved Mining Methods for thick Coal Seams with Emphasis on Health, Safety, and Environmental Research.

Establishment of a three dimensional Network for detailed Investigation of Problems related to Ground Motion during Earthquakes and its Effects upon the response of the Surface Layers and Structures.

Research on crystal Structure in Relation to Earthquakes; intrusive and metallogenic Provinces.

Soil Subsidence Due to Salt Leaching and Coal Mining.

Geochemical surveys based on statistical sampling designs.

National Bureau of Standards

Organofunctional Derivatives of inorganic Surfaces

Development of Methodology for Standardization at the Trace Level.

Standardization of Methods for the Measurement of the Thermophysical Properties of Materials and the Thermophysical Characterization of Standard Reference Materials.

Resonance Broadening of spectral Lines and Determination of Atomic and Molecular Parameters.

Phase Diagrams for Ceramics.

Investigation of Electron-atomic and Molecular Binary Collision Excitation Processes.

Theoretical Investigations of physical Surfaces.

Absolute Sputtering Yields for the Analysis of Surfaces.

Application of the stark broadening of spectral lines as an independent plasma diagnostic method.

X-ray Diffraction, electron-microscopic Studies and the Investigation of Transport galvanometric and magnetic Properties of Alloys obtained by rapid Quenching from the Melt.

Measurement of differential Cross-section for elastic and inelastic Scattering of ions by metal Atoms.

Electrochemical Determination of Trace Elements and Surface Active Substances.

Interaction of metal ions with bioligands (thermodynamic aspects).

Physico-chemical Aspects of urinary Stone Formation.

Radiochromic Dye Dose Meters for Radiation Research and Technology.

Mass spectromatic Studies of high temperature Equilibria.

Development of monomolecular Layers for Preparation of radioactivity Standards of Nucleides Emitting Low-energy Electrons.

Electron-induced Desorption of Alkali Ions and Atoms from Metal surfaces.

Quantitative chemical Analysis of Alloys, Compounds, and Minerals by means of SIMS.

Elastic and inelastic Neutron Scattering from Liquid Metals and Alloys.

Development and Application of ultrasensitive magnetic resonance Methods.

Trace elements in biological materials.

Thermal Degradation of Polymers.

Basic and Applied Studies of Carbamates and related Compounds.

Development and Application of Modern Electrochemical Relaxation Methods Using Computerized Automated Electrochemical Systems.

Computer Networks.
Fracture mechanics of weldments.
Exchange of scientists in order to develop priority projects.

NATIONAL SCIENCE FOUNDATION

Development of new Fluid Particle Systems
Seismic Resistance of high-rise Buildings constructed by industrialized Methods.
Studies in Particle Physics and multi/particle Breakup Reactions.
Mathematical and computational Studies in Molecular Quantum Mechanics.
Improvements of the Characteristics of Gear and Worm Gear Drives.
A novel Approach to Crystaline Fructose and Gluconic Acid.
Investigation of the Relationship between the Working System and Workability in the metal Deformation Processes.
Chemistry, Morphology, and Characterization of irradiated polymeric Systems.
Enzymes from Snake Venom.
Parameter System Identification of Structures for dynamic Loads.
Seismic Effects in liquid storage Tanks and Pipelines.
Synthesis and Characterisation of some rheologically interesting Polymers.
Experimental and analytic Investigation of Soil-Structure Interaction Effects on Dynamic Response of Structures and Foundations.
Studies of Tissue Proteinase.
Studies of irradiation Resistance of candidate Materials for Fusion Applications.
The Study of Nuclear Structure in the Cluster-Vibration Model in the Region of Medium-Heavy Nuclei.
Laser Light Scattering in Ferroelectrics and Ferroelastics.
Low Frequency molecular Interactions in Solids and Liquids.
Problems in electrochemical and chemical Deposition and Dissolution of Metals.
Aluminum Alloys for Electrochemical Power Sources.
Chiral Liquid Crystals.
New materials for efficient solar/electrochemical energy converters.
Quantum flavour dynamics: Phenomenology and grand unification.

SMITHSONIAN INSTITUTION

Comparative Investigations of Taxonomy of fresh and marine Water Amphipoda.
The Nanoplankton/Microzooplankton Predator/Prey Link in the Northern Adriatic Marine Food Web.

Mr. SWIFT. With that, Mr. Lawson, thank you very much for being here. We are delighted to hear from the Department of Commerce, and particularly from you, as Deputy Assistant Secretary for East Asian and Pacific Affairs.

Your formal statement will be made a part of the record. You may proceed as you wish.

STATEMENT OF EUGENE K. LAWSON, DEPUTY ASSISTANT SECRETARY FOR EAST ASIA AND THE PACIFIC, U.S. DEPARTMENT OF COMMERCE

Mr. LAWSON. Thank you very much, Mr. Chairman and Mr. Lent. I am very pleased to testify here before this committee.

We in the Department of Commerce administer, as you know, two protocols under the agreement: the hydropower protocol and the protocol on the management of science and technology and scientific and technological information.

The statement that I have submitted for the record, which is a lengthy statement, describes in detail the status of these protocols and their operation. But what I would like to do this morning is to very briefly review in an oral summary our objectives under each of the protocols and to give you my own assessment of their impact on the development of United States-China trade relations.

First, let me briefly describe the evolution of the hydropower protocol for which I serve as the U.S. national coordinator.

This program was initially viewed primarily as a government-to-government effort, and the involvement of the U.S. Government agencies in assisting the Chinese to develop an overall hydropower program was intended to give an edge to the U.S. private sector over foreign competitors when China was ready to purchase consulting and engineering services as well as equipment and machinery.

By strengthening the professional relationships between United States and Chinese personnel, the program did advance this objective. But there was some disappointment that annex 1 had preempted private engineering and consulting companies from any involvement in China's hydropower projects.

The responsibility for the management of the program was transferred from the Department of the Energy to the Commerce Department and this coincided with the closeout of annex 1 activities. We made a decision to try to give the protocol greater commercial content, more private sector content.

After rather lengthy and close consultations with the private sector in preparation for the negotiations on a work program for the following 2 years, that is annex 2, we concluded that the momentum of cooperation should be maintained. Both Government and the industry officials agreed that despite the fact that in 1980–81, when the Chinese were in the process of scaling back their hydropower plans as part of their overall readjustment program, bilateral cooperation could, indeed, bolster U.S. industry's position to compete for future business.

However, it was also decided that in order to obtain maximum commercial benefits for the United States from this cooperative activity, the private sector must be significantly involved and the focus of activities should shift from the more general planning programs of annex 1 to project specific activities in annex 2.

Now, Mr. chairman, we are generally satisfied that these objectives are being met. The significant expansion of the role of the private sector and protocol activity is, in my view, a major achievement under annex 2.

Although the Chinese remain keenly interested in U.S. Government involvement, they have agreed to give the private sector a major role in virtually all of annex 2 activities. And just to illustrate this change, the recent six-man delegation to China which traveled to China to discuss the Ertan hydropower project included four private sector participants.

One other aspect of annex 2 which we feel would advance our commercial interests is the shift toward activities directly related to specific hydropower projects. For example, one major annex 2 activity involves U.S. engineering companies in a feasibility study for a priority Chinese project. Yet others focus on planned projects which are likely to be implemented as China's modernization program progresses.

I believe that the U.S. Government agencies and companies participating in protocol activities agree that the cooperative effort at this stage with the Chinese will pay off in the long run.

The Chinese have the world's largest hydroelectric resources by far, but they lack the technical, managerial and financial resources to try to develop them quickly without foreign assistance. I believe that the modest investment that we are making now will yield significant opportunities on down the line for U.S. companies.

Next, the protocol on the management of science and technology and scientific and technological information consists of two programs. Let me briefly review the results thus far on cooperation in the field of information which is administered by the National Technical Information Service.

This is a cooperative program with China's Institute of Scientific and Technical Information, which is an agency of the State Scientific and Technological Commission. The specific objectives are to establish communication lines at the upper management levels of the two agencies, to provide for mutual access to and exchange of certain kinds of scientific and technical information, to train Chinese information managers, and to provide for the translation of Chinese technical materials into English.

In general, these programs have been useful by providing the United States for the first time a look at Chinese institutions dealing with open source technological information. We will continue to work, however, to expand access to Chinese technical literature similar in nature to that made available to the Chinese by us, by the NTIS, which thus far, frankly, has been relatively limited. But we expect that as the program progresses that the exchange of information will also expand.

Finally, I wish to report on a program that has been characerized as perhaps the most successful of our cooperative efforts. During the recent meeting with Secretary Baldridge, Chinese Foreign Minister Wu Xueqian singled out the Dalian Management Center for its contribution to China's modernization. The center, which is administered jointly by us, the Commerce Department, and three Chinese organizations, has provided intensive management training to approximately 750 Chinese officials and managers.

Many of the participants have received recognition and promotion to positions of substantially greater responsibility in industry and government.

I believe, Mr. Chairman, that the program has, at an extremely modest cost, yielded substantial benefits for the United States.

First, the Dalian Center promotes pro-U.S. attitudes among current and future leaders in Chinese Government, industry and education.

Second, it will enhance opportunities for United States-China trade since the graduates of Dalian have responsibility for purchasing equipment and technology from abroad as well as establishing policies for procurement.

And third, the center serves as an indispensible window for the United States, yielding valuable insights into China's economy.

Perhaps the major indicator of the success of the program is the fact that several foreign countries, including Japan, West Germany and the EEC, have proposed to sponsor similar programs. China is planning to eventually establish a total of eight such centers.

We are currently giving favorable consideration to extending the period of cooperation for another 5-year period. They have asked us to expand the program. While we are enthusiastic in principle to the Chinese ideas for expanding the program, we are not certain to what extent the Department of Commerce will be able to sponsor these activities under current budgetary constraints—will we have the money, Mr. Chairman.

In conclusion, I believe that the activities that I have described are an important element in our effort to contribute to China's modernization program and that they have been highly successful in advancing U.S. economic, commercial and trade policies in China.

Thank you, Mr. Chairman.

Mr. Swift. Thank you very much, Mr. Lawson. I appreciate your statement.

[The statement of Mr. Lawson follows:]

STATEMENT BY EUGENE K. LAWSON
BEFORE THE SPECIAL SUBCOMMITTEE ON
U.S. TRADE WITH CHINA
OF THE
COMMITTEE ON ENERGY AND COMMERCE
OCTOBER 31, 1983

INTRODUCTION

I am pleased to testify today before this Committee on the programs being implemented by the Department of Commerce under the Protocols on Cooperation in Hydroelectric Power and Related Water Resource Management and on the Management of Science and Technology and Scientific and Technological Information. The Administration believes that these activities are an important element in our effort to contribute to China's modernization program and that they have been highly successful in advancing U.S. economic, commercial, and foreign policy objectives in China.

HYDROPOWER PROTOCOL-DEVELOPMENT AND CURRENT STATUS

Prompted by the high priority given to development of energy resources and to solving problems of energy distribution in China's modernization program, discussions began during Energy Secretary Schlesinger's visit to China in 1978 on potential avenues for bilateral cooperation. Subsequent discussions resulted in agreement to pursue cooperation in the area of hydropower, where the Chinese were planning a massive expansion of their electric power supply. Signed during Vice President Mondale's visit to China in August, 1979, the Hydropower Protocol became the starting point for developing a program for bilateral cooperation in this field. Specific projects to be undertaken were agreed to under Annex I to the Protocol, which was concluded in March, 1980. Administered on the U.S. side by the Department of Energy, the activities under Annex I were carried out by a number of interested U.S. agencies, including the Bureau of Reclamation, the Army Corps of Engineers, and the Tennessee Valley Authority. The implementing agency on the Chinese side was the Ministry of Electric Power.

Activities under Annex I included exchanges of delegations, training, and feasibility studies. These exchanges covered a wide range of subjects, from multi-purpose river basin planning to engineering design and construction planning for specific planned hydropower projects. All but two of the activities provided for in Annex I were completed. The implementation of the remaining activities, specifically the placement of Chinese specialists with the Army Corps of Engineers and the training of 50 Chinese specialists, were deferred to Annex II.

Annex I was perceived as an initial phase in the hydropower development program, which would focus on the development of an overall program, including identification of projects and possible development of design concepts leading to the construction stage. At this initial stage, therefore, the program was seen as primarily a government-to-government effort. As cooperation under Annex I progressed, however, delegation visits increasingly included representatives from U.S. private industry. Although the exchanges were successful in strengthening the professional relationships between U.S. and Chinese water resources personnel, there was some industry disappointment that Annex I had preempted private sector involvement in Chinese hydropower projects.

As Annex I activities were drawing to a close, responsibility for the management of the program was transferred from the Department of Energy to the Department of Commerce. In preparation for negotiations on a new work program (Annex II), the Department carried out consultations with the U.S. private sector to discuss our future approach to this cooperative program. The conclusions which emerged from those discussions were later incorporated in the U.S. negotiating position. Specifically, it was felt that the momentum of bilateral hydropower cooperation should be maintained despite the scaling back of Chinese hydropower plans which was occurring at that time, so as to bolster U.S. industry's position to compete for future business. Because the primary value of the Protocol to the United States lies in the potential to provide for U.S. private sector participation in Chinese hydropower projects, it was agreed that private industry must be significantly involved in Annex II activities. To obtain maximum commercial benefits for the United States from bilateral cooperative activity it was also felt that the focus of activities under Annex II should shift further toward project-specific efforts.

Annex II to the U.S.-PRC Hydropower Protocol, signed in September 1982, sets forth a two-year cooperative work program in which U.S. private companies play a major role. The technical capabilities of several U.S. Government agencies, including the Bureau of Reclamation, Army Corps of Engineers, and Tennessee Valley Authority, are being utilized to help organize and carry out technical exchanges under the protocol. Activities under Annex II include exchanges of delegations, seminars, training, and feasibility studies. For the most part, the delegation exchanges, feasibility studies and training are connected with specific Chinese hydropower projects that are either underway or in the planning stage. For example, one major Annex II activity involves U.S. engineering companies in a feasibility study, overseen by the Army Corps of Engineers, for a priority Chinese hydropower project, Tianshengqiao. Likewise, most of the delegation exchanges focus on planned projects, such as Ertan, Longtan, and Three Gorges. Although these have been delayed for the time being, they are likely to be revived as China's modernization program develops. The seminars cover a wide range of subjects, from multipurpose river basin planning to financing of large hydropower projects. Annex II activities probably will extend through 1984.

The following activities provided for in Annex II have been, or are currently being implemented:

- placement of Chinese specialists for training in U.S. Government agencies with the first contingent expected January, 1984;
- completion of a feasibililty study for the Tianshengqiao project by a U.S. engineering company funded by the Trade and Development Program;
- Chinese delegation on the three Gorges project currently in the United States under Bureau of Reclamation sponsorship;
- U.S. delegation visited China in the spring of this year to discuss technical aspects of the Ertan project;
- technical seminar on hydropower engineering and equipment co-sponsored by the Ministry of Water Resources and Electric Power and the Department of Commerce in June, 1983;
- seminar on multipurpose river basin planning hosted by TVA in the spring of this year.

The significant expansion of the role of the private sector in Proto[illegible] activities is a major achievement under Annex II. Although [illegible] Chinese remain keenly interested in maintaining U.S. Government involvement in bilateral cooperation, they have agreed to give the private sector a major role in virtually all Annex II activities.

In conclusion, I believe that the U.S. Government agencies and companies participating in Annex II activities agree that these bilateral cooperative efforts will pay off in the long-run. The Chinese have the world's largest hydroelectric resources, but lack the technical, managerial, and financial resources to develop them rapidly without foreign assistance. We believe that cooperative activities at this stage will lead to significant commercial opportunities for U.S. companies.

PROTOCOL ON COOPERATION IN THE FIELDS OF MANAGEMENT OF SCIENCE AND TECHNOLOGY AND SCIENTIFIC AND TECHNICAL INFORMATION

The Protocol was signed on May 8, 1979 in Beijing by then Commerce Secretary Juanita Kreps, and Fang Yi, Chairman of China's State Scientific and Technological Commission. The Protocol consists of two principal parts: (1) cooperation in the field of management of science and technology, and (2) cooperation in the field of scientific and technical information. The former is administered by the International Trade Administration's Bureau of East Asia and the Pacific, the latter by the National Technical Information Service.

Management of Science and Technology

Activities carried out under this part of the Protocol include exchanges of delegations on industrial management and management training, joint symposia and conferences on such topics as systems engineering and on management and economic planning. However, the most significant activity has been the establishment of a joint training/management program, the National Center for Industrial Science and Technology Management Development, (NCISTMD), Dalian, located in Liaoning Province, China. The Center has been in operation since 1980.

The training program is planned and administered jointly by the Bureau of East Asia and the Pacific in the Department's International Trade Administration, and the following Chinese agencies: the State Economic Commission (SEC), State Scientific and Technological Commission (SSTC), and the Ministry of Education.

The Center provides an intensive training program which approximates that of a two-year MBA curriculum commonly found in the leading U.S. business schools, but with more emphasis on the management of scientific and technological change. The U.S. has been responsible for the initial curriculum design, development of teaching materials, and instruction. Later Chinese faculty will assume responsibility for a significant portion of the program.

Each year, a U.S. faculty and a Chinese faculty are organized. From 1980 to 1983, 44 American faculty members, representing 26 U.S. universities, nine private corporations and three government agencies have participated. The Chinese Ministry of Education has organized a nine-university consortium to support the Center by providing faculty and staff support.

Typically, subjects such as managerial accounting, statistics, managerial economics, financial systems and control, marketing, organizational behavior, and production and operations management are taught in the initial part of the program. In the second part of the program more attention is given to research and engineering management, information systems, strategy and policy formulation, as well as a variety of special topics such as legal aspects of international trade, project management, countertrade, project financing, etc.

Although much of the work, especially early in the program, is accomplished through lectures and readings, the U.S. professors use problems, cases and computer exercises which engage the participants more actively in the learning process. The courses in the later portions of the program tend to focus more on applied integrative work, including class teams working together on management problems and such exercises as computer-based management simulation. Thus, participants gain some familiarity with the types of data and decisions which American managers commonly face.

Since the inception of the program, American corporations have supported the Center through donations of equipment and teaching personnel. These include data processing and computing equipment (20 IBM Personal Computers, one CDC Cyber 18 with 15 terminals, one Wang OIS Word Processor, and calculators from Hewlett Packard and Texas Instruments), audio-visual equipment (from RCA, Eastman Kodak and 3-M), and xerographic machine (from Xerox).

The students who participate in the Center are selected by the three Chinese agencies from throughout China. The State Economic Commission sends guidelines to provincial and municipal economic commissions, which solicit nominations from local enterprises. The Ministry of Education selects participants from university faculties, and the State Science and Technology Commission selects R&D administrators. The average age of participants is in the mid forties. The caliber of students has been high, and they all have had college-level education plus years of experience in leadership positions. About two thirds of the participants are industrial executives (factory directors, deputy directors and chief engineers predominate) and ministry and bureau officials. The remainder come from the Chinese Academy of Sciences and various universities.

From 1980 to 1983, approximately 750 participants have graduated from the Center. Many have since received recognition and promotions to positions of substantially greater responsibility in industry and in government which can be traced directly to their participation in the program. Among them are the current First Secretary of China's Communist Youth League, Vice Minister of the Ministry of Coal Industry, Vice Governor of Shanxi Province, and several mayors, chairmen of provincial municipal economic commissions and science and technology commissions, directors of government bureaus and responsible persons in joint venture companies.

Perhaps the major indicator of the success of the program is the fact that several foreign countries (including Japan, Canada, West Germany, EEC, Hong Kong) have proposed to sponsor similar programs jointly with the Chinese Government. China is planning to eventually establish a total of eight such centers throughout China.

From the U.S. point of view, the program has a long-term, positive impact on U.S.-China relations with substantial benefits accruing to both sides. The Center promotes pro-U.S. attitudes among current and future leaders in Chinese government, industry and education. It will enhance opportunities for U.S.-China trade, since graduates have responsibility for purchasing equipment and technology from abroad as well as establishing policies for such procurement. The Center can also serve as a window for the U.S. to gain insights into China's economy. The Center's programs, on the other hand, can serve as models of effective U.S. involvement in economic development in developing countries. If we assess these benefits against the modest cost of the program, it is considered a most cost-effective investment for the U.S.

We are now in the process of considering the future of the Dalian Center. Annex IV of the Protocol provides for continuation of the program for five years (1980-1984). Due to the success of the Center, the Chinese Government would like to expand program activities to encompass the following comprehensive three-tier management training activities:

o a 7-8 week program each year for about 40 senior executives at the level of bureau director and above on macro economic planning and management;

- a nine-month program for the mid to upper level senior cadres on microeconomic planning and management (the Base Program); approximately 200-250 enterprise managers, government officials, R&D administrators and university faculty would participate each year; and

- a three-year program for younger, mid-level management cadres to be selected based on their demonstrated leadership quality and career potential. The first year would be preparatory in nature, and the last two years would involve a formal MBA program conducted in cooperation with a U.S. university under the aegis of the Department of Commerce.

During his recent meeting with Secretary Baldrige, Chinese Foreign Minister Wu Xueqian singled out the Dalian program, and expressed the Chinese Government's wish that the Department expand its support of the program.

The Department is currently giving favorable consideration to extending the period of cooperation for another five years (1985-1989). Although we could agree in principle to support the concept of the three-tier program as proposed by the Chinese, it is not certain, however, to what extent the Department will be able to sponsor all of the activities under current budgetary constraints.

Scientific and Technical Information (Annex III)

The working participants of Annex III are the Commerce Department's National Technical Information Service (NTIS) and the Institute of Scientific and Technical Information of China (ISTIC), an agency of the State Scientific and Technological Commission. The overall objective of the program is to engage in cooperative projects of mutual interest in scientific and technical information. The specific program goals are listed below and discussed in subequent paragraphs.

-- Establish a communication link at the upper management level.

-- Provide for mutual access to and exchange of certain kinds of STI.

-- Initiate a work-study program involving ISTIC managers resident at NTIS.

- -- Provide for the translation of technical materials into English.

Communication links The Director and Deputy Director of ISTIC have, on separate occasions, visited NTIS. In May 1981, Melvin Day, then Director visited ISTIC. This was followed in August 1982 by a small delegation led by current NTIS Director, Dr. Joseph Caponio. Both delegations visited a number of technical information facilities in addition to ISTIC.

During Melvin Day's visit, it was agreed to add the work-study and translation components to Annex III. Dr. Caponio's visit resulted in the establishment of a program, not part of the Protocol, which provides an opportunity for U.S. technical information professionals to lecture and observe in China.

The exchanges of visits have, for the first time, provided a look at the institutions and individuals comprising the open-source technical information infrastructure in China. They have also put both sides on friendly terms.

Exchange of scientific and technical information. The Protocol states that ISTIC and NTIS will provide each other with scientific and technical information from their respective institutions at favored prices. Accordingly, ISTIC is permitted to purchase NTIS products and services at domestic prices, rather than at foreign prices. This means that ISTIC pays one-half of what a foreign buyer would normally be expected to pay.

ISTIC has a standing order for two microfiche copies of every NTIS technical report* which is available in microfiche. This amounts to approximately 60,000 individual titles per year. Documents not available on microfiche and subscription items are also purchased on an individual basis. The total dollar value of sales to ISTIC is about $260,000 per year. This makes China the sixth largest foreign buyer of NTIS materials.

For its part, ISTIC offered to allow NTIC to purchase some designated technical and semi-technical Chinese-language journals at Chinese domestic prices. This was the same package of materials that ISTIC normally offers libraries with which it establishes exchange relations. Since the NTIS data base is intended to cover only technical report literature, not journal literature, the ISTIC material was of no direct use to NTIS. Initally, NTIS did subscribe to some of the journals and passed them to intelligence analysts. The practice was discontinued, however, in view of the relatively easy availability of the items from other sources.

It would be highly desirable to obtain from the Chinese technical reports similar in nature to those that they obtain through NTIS. Requests to ISTIC for such materials yeild "will look into it" type responses, but as yet no tangible result. It is highly likely that technical materials not published in the open journal literature are considered security classified.

Work-study program NTIS has agreed to accept Chinese information scientists in a resident work-study program. The period of residence in each case is one year. Thus far, six Chinese have participated in the program, five from ISTIC and one from the Beijing Documentation Center. All have been mid-level managers.

In general, the participants have eventually adjusted quite well to the U.S. work situation and have been quite productive. However, no real exchange of ideas has taken place. This has been due to a virtually uniform reticence of the Chinese to put forward any suggestions or even discuss the ways in which comparable tasks are accomplished in their own organizations.

Translations ISTIC has a translation staff, which is something that NTIS does not have. Therefore, a pilot program was launched in order to explore the possibility of ISTIC translating Chinese- and Japanese-language technical documents into English. In order to compensate ISTIC for the work, NTIS would give ISTIC credits towards the purchase of NTIS materials.

One test batch of translations was produced. The quality of the translations proved to be of too low a quality to be of use to NTIS. It may have been possible to work toward an improved quality. However, the resources to operate the project were being furnished by the NTIS Foreign Technology Acquisition Program. This Program was one of the few NTIS programs to receive appropriated funding since NTIS became a fully self-supporting agency in the early 1970's. The appropriation was not reviewed and the translation activity was not renewed.

The reports under consideration are unclassified technical documents which have resulted from research done by or for the U.S. Government.

Mr. Swift. Incidentally, there are some fairly technical questions that we will submit to you for your response in writing, and we will leave the record open for your response.

[The information may be found on p. 77:]

Mr. Swift. Are you talking about just the generic budgetary constraints that we have with $200 billion deficits hanging over us, or do you feel there is something in addition to those pressures that are posing problems? In other words, do these particular activities have an inordinately low priority in your judgment or were you just referring to the generic?

Mr. Lawson. I was really referring to the former category, the generic category, because obviously Mr. Horner agrees with me that we have placed a very high priority on all these projects and devoted many man-hours to them.

Mr. Swift. Well, those generic constraints are very real, and we all are struggling.

What are the current prospects, do you think right now, for U.S. firms in China's hydropower development? Are they really pretty good, as you look down the line?

Mr. Lawson. Well, it is a little bit hard to look into the crystal ball here because the hydropower projects by their nature are extremely large, technical projects here. The Chinese in their 5-year development plan have put a high priority on it, not the highest priority. The highest priority for their energy development has been in offshore oil and coal, and hydropower projects, of course, because they involve moving a lot of people out of the way of these projects, of resettlement issues which are very complex and complicated.

I would anticipate, Mr. Chairman, that in the next 10 to 15 years or so, and we have got to have some measure of patience in this, I believe, that U.S. industry is going to benefit mightily from participation in China's hydropower projects. There are at least six to eight projects that still need to be studied more and have to have feasibility studies done on them, but I can foresee that those six to eight large projects involving billions of dollars in each of the projects would come to fruition in the next 10 to 15 years. So we are talking here about large expenditures by the Chinese.

Mr. Swift. Is it also true that most of their hydroelectric potential is in the West and most of their need is in the East? And that they have a problem with transmission loss, and continuing developments in the efficiency of electrical power transmission will make those projects more attractive for them in the long run?

Mr. Lawson. That is precisely said. That is the reason why I sort of put it off somewhat 10 to 15 years to allow for a certain infrastructure to be built up to accommodate the transmission of power into the areas along the coast where it is needed and in the meantime coal development and other things, nuclear energy, will make up for that temporary gap.

Mr. Swift. And I know the crystal ball is hard to look into, it is cloudy, but it seems to me you have two kinds of financing problems. One, simply because those projects are so massive they might pose serious financing problems; and two, American industries might be less able to participate if they have problems obtaining competitive financing for their participation.

Mr. LAWSON. I think there are three or four different sources of possible funding for the Chinese. First, of course, is recourse to the World Bank and the World Bank has become increasingly a friendly lender to the Chinese.

Second it is to the IMF to soft window areas. The Chinese are going to go to that window first before they go to the large international commercial markets.

But third is the large commercial markets. We in this country have informed the Chinese that the United States has the largest capital market in the world. They have not really availed themselves of our markets yet because they want to go to the soft windows first, to draw that down. But throughout the world in the United States and in the Western countries, there is probably on the order of somewhere between $30 and $32 billion of credit sitting there waiting for the Chinese to take advantage of that if they should want to.

Now, the fourth source of financing is their own internal financing. In the last 2 years they built up a trade surplus of almost $11 billion. So if they want a project badly enough, they can pay for it themselves. It is a question of their own priorities here.

Mr. SWIFT. I didn't hear the "M" or the "B"; is it $11 billion?

Mr. LAWSON. $11 billion, yes, sir. Conventional wisdom used to have it that the Chinese really couldn't pay for things. That is not the case anymore. It is up to them what they want to pay for, but they do have the resources to pay for some of these things.

Now, as to the other question of U.S. funding, it is very dificult for U.S. hydropower companies to come up with financing. Eximbank financing in modest sums is available, but it doesn't begin to cover, as you know, Mr. Chairman, better than anybody, the kinds of large dollar amounts that are needed for these kinds of projects.

If I could add a fifth source of financing, that is the Hong Kong financial market. Many of the ethnic Hong Kong Chinese have enormous capital resources, and those are being tapped by the People's Republic.

Mr. SWIFT. I mentioned the issue of feasibility studies in a question for the preceding witness. I would like you to comment and fill in the record on how American industry may benefit if U.S. firms are able to conduct or participate in feasibility studies under the protocols. Would you lay out that relationship?

Mr. LAWSON. I think it is an historical fact that where the United States has been able to assume a feasibility study that there is a high chance that U.S. business will follow immediately afterward. We are severely handicapped in China, Mr. Chairman, by the fact that the trade development program has such a modest budget. That is, frankly, about the only source of feasibility money that the U.S. Government has to operate in China.

Last year I think that budget was about $5.5 million, and they are going to expand it to about double that this year and even more in fiscal year 1984. I would love to see it go up to $20, $30, $50 million here.

OPEC has a little tiny feasibility program that sometimes we have been able to tap into, but these are very small dollar amounts. If we had more money to offer U.S. firms and offer the Chinese for feasibility studies, I shouldn't make predictions, but the volume of our business and our trade with China would vastly increase. It is not there in the U.S. Government now, except in the trade development program.

Mr. SWIFT. Accepting that and not laying any blame for that, but recognizing it as the condition that persists, do you feel we are missing an investment opportunity? In other words, you have got to spend some money sometimes to get your business started. You have to invest money to keep it going, and it seems to me that the investment analogy fits pretty well, particularly at this stage of China's development. Is that accurate?

Mr. LAWSON. Yes, sir.

I think that is entirely accurate. We lose business throughout East Asia and especially in China to our competitors like France, Britain and especially the Japanese. The Japanese have extremely attractive export and project financing which we can't possibly match.

I think if there is one common theme that runs through the talks that I have had with U.S. businessmen in trying to do business with China and in East Asia, it is the lack of financing. They are severely circumscribed by that and it is certainly the case in China when we are now on the eve, Mr. Chairman, of, I would say a new phase in our trade and economic relationship.

We have now changed drastically, as you know, our transfer of technology policy to allow exports of high technology equipment and technology to China. There is a large market for telecommunications and electronics in China. We are now poised to take advantage of these opportunities in China where there is a natural fit of China's natural resources and U.S. technology.

We are really the best, or among the best in the world, in offshore oil, in surface open pit coal mining techniques and building high-arch dams, and in electronics equipment, which you pointed out previously with Mr. Horner and in telecommunications of all kinds. And so there is a natural fit here, but we are circumscribed and handicapped by the lack of adequate financing.

Mr. SWIFT. I would like to ask one more question along that line before I recognize my colleague from Minnesota. What are our trading competitors doing in this area of feasibility studies? Are they better able to fund those studies, so that their firms participate, than we are at the present time?

Mr. LAWSON. Yes, they are, as a general statement. They do it readily; whenever they can, they do it. I have yet to run across an instance, and I am sure there are some, but I just haven't seen it in the last couple of years here, where one of our major competitors would not be able to come up with the money for a feasibility study. They realize, as we do, that trying to obtain that study is the key to future business.

It is a crucial factor, and we were pleased that under the hydropower protocol, we were able to do the feasibility study on Tianshengqiao, which is one of the major hydropower projects that is now moving to fruition, because that gives our engineers the inside track for future business.

Mr. SWIFT. In other words, our major competitors didn't become major competitors because they were too dumb to figure out the advantages of getting in on the ground floor.

Mr. **Lawson**. No, they didn't.

Mr. **Swift**. We recognize it too, but we are having trouble getting the funding to finance that kind of activity and make that kind of investment.

Mr. **Lawson**. That is right, Mr. Chairman.

Mr. **Swift**. I recognize the gentleman from Minnesota.

Mr. **Sikorski**. Thank you, Mr. Chairman.

On that item, the private sector clearly has played a major role in this Dalian project. I know two Minnesota corporations, 3 M and CDC have been contributors to that.

Mr. **Lawson**. They have been very generous contributors. We are in the fourth year of a 5-year agreement with the Chinese. The Chinese have asked us to extend for another 5 years, and we are in the process of talking about that with them. The private sector has been very generous with them. They have given money. I have approached some of the oil companies. They have given goods and technology as CDC has. They have also given time.

Part of the U.S. faculty that teaches the 9-month course at Dalian comes from the U.S. private sector. Corporate executives are sent over to Dalian for weeks or months on end, and there is a valuable contribution in kind too. So the private sector has been very supportive and, frankly, I probably need to do a better job of trying to get more private sector support for this very worthwhile effort.

Mr. **Sikorski**. Then I take it that it has been successful to the point that the Chinese are interested in expanding it. If that is wise, and it probably is, would there be a potential for private sector involvement in the expansion process?

Mr. **Lawson**. Yes, there is, and it would take the form of those three kinds of contributions I just mentioned. The Chinese want to expand it in a rather dramatic fashion, really. I will just mention one of the things and that is establishment of a 3-year MBA program where a U.S. university would be the degree-giving institution. This would result in a doubling of the Department of Commerce's contribution if we were to agree with that.

Mr. **Sikorski**. What are the numbers on that now?

Mr. **Lawson**. The funding right now is at $180,000 per year. It will go up to $220,000 for the fifth year and then if we were to add this 3-year MBA program, it would just about double that.

Mr. **Sikorski**. That has the impact, you know, in your statement, of officials from the Sian province and everywhere. They are filtered throughout the country in terms of people who had this contact and this background, and it pays off for American companies doing business with China, as well as for official relations.

Do you look favorably on that kind of explanation?

Mr. **Lawson**. Yes, we do, and I think the private companies have been helpful here. We have to realize that the private companies have been approached by many, many different kinds of organizations and institutions in this country for funding of various kinds for China, and sometimes the well runs a little bit dry even for something that is so worthwhile as Dalian, which everybody agreed is a jewel in our science and technology crown; nonetheless, you do hit up against——

Mr. **Sikorski**. There are some money-making corporations that aren't paying any Federal taxes. Maybe they could shift some of that, and I would guess part of it is because they are involved in these types of projects.

Are there any other nations that are going to be competitive to us in this particular fashion?

Mr. **Lawson**. Yes, there are six or seven countries that are going to be setting up centers similar to, but not exactly, like ours. These will be set up in the provinces, and they won't be national centers. They won't draw on students from across the country, as we do. We were the first ones to get there, and we set the model for it. Immitation, I guess, is the most sincere form of flattery.

Mr. **Sikorski**. The Japanese?

Mr. **Lawson**. The Japanese have one on the boards. The French, the Germans, the EEC and two or three others have been approached too. The Canadians have one.

Mr. **Sikorski**. In your mind, looking at the scientific and technical information sharing process, how do the Chinese view our willingness to share information with them, in your mind?

Mr. **Lawson**. Well, we can't give them enough. There will never be a way to satisfy their desires for as much information as we can give them. Of course, we have in our own perspective been enormously generous in sharing this information with them.

Mr. **Sikorski**. I didn't get the impression that they are always appreciative of that enormous willingness on our part, as you describe it.

Mr. **Lawson**. Well, I would say that the sharing of this kind of information is part of the technology transfer process. They were extremely critical about certain aspects of our export licensing policy. Our reply to them was, look, you have to look at transfer of technology as a general thing and the sharing of information is definitely part of technology transfer, as is training and as 10,000 Chinese students in this country is technology transfer too.

Mr. **Sikorski**. The hearing aids go off on those last two points.

Mr. **Lawson**. They do.

Mr. **Sikorski**. Would good quality Chinese and Japanese translations be helpful to us, English translations of their documents, be helpful to our interests?

Mr. **Lawson**. Yes, it would. It would depend on what scientific fields we are talking about. Some obviously would be more helpful than others. We are, of course, more advanced than they are in some of these areas, but there are some areas in which they have done some very interesting research from which we could certainly benefit.

Mr. **Sikorski**. I am thinking we have very few people in comparison to the Japanese and Chinese who can speak those languages. It seems to me that they are using our information and developing it and sending it out in different directions, and it would be helpful to us to do the round trip in the circuitry. I am wondering if you have looked at that and what the cost attachments are to that?

Mr. **Lawson**. Well, I think it is an interesting phenomenon that we really have considerably more Chinese speakers in this country than we do Japanese speakers, although the level of trade is vastly different between the two countries and the United States.

Nonetheless, for many, many years, China has exercised a tremendous attraction to the U.S. student. And we have, in fact, built a cadre of able Chinese speakers in both the State Department, the Foreign Commercial Service, and the Department of Commerce, and I think you would be pleasantly surprised at the number of Chinese speakers that we have at the technical agencies that carry out the scientific and technical program.

Mr. **Sikorski**. I was surprised that in China all the people in the embassy and others were fluent in Chinese.

Mr. **Lawson**. Yes.

Mr. **Sikorski**. But I am concerned about almost an arrogance on our part that we impart information but we don't close the circle and get back the information that we have imparted and it has been improved upon, I am concerned that that translation program could play an important role in that function.

Mr. **Lawson**. Well, we are expanding that translation program if you are referring to the protocol here that NTIS does administer. That program is being expanded. I would agree with you that there is a gap that needs to be closed. It just takes a little bit more time to do it, I think, but we are working at that.

Mr. **Sikorski**. Thank you, Mr. Chairman.

Mr. **Swift**. I recognize minority staff.

Mr. Bosco. You mentioned programs that have limited funds available for feasibility studies, such as TDP, OPIC, and then, of course, we have Eximbank. If I may ask, who takes the lead in orchestrating a comprehensive approach to export financing such as in a major hydropower project?

Mr. **Lawson**. In a major hydropower project, the Commerce Department certainly takes the lead, but we don't really have very many places to go so the load invariably goes right back to Mr. Christopher Holmes of the trade development program. Since he devotes nearly 25 percent of his very small budget to China, though, I feel it is very hard to ask him to do more than that.

That involves expenditure at a large proportion of his budget on one country. He is a believer in doing business with China and he knows that this is the single best way to get a little bit of advantage on the Japanese and French. But it is a problem and we could use some more financing for the TDP.

Mr. Bosco. Yes, sir, I am also speaking toward the idea of following a project through from beginning to end, from the feasibility study stage on through to the actual export of U.S. goods and services which hopefully would involve Eximbank.

Has any project yet gone through that kind of approach by looking at how U.S. Government programs can be integrated?

Mr. **Lawson**. Not in the hydropower field. In the case of the one project that we have, Tianshengqiao, a feasibility study has been completed by Harza Engineering and submitted to the Chinese for their approval. We would expect that in the next 6 months or so decisions will be made about how to finance that project. That is when U.S. companies will come into the act.

The Major Projects Division at the Department of Commerce will be closely monitoring how, why, what, where and when we can give support to the U.S. private sector when that phase comes.

Mr. Bosco. You also mentioned that several major competitors in the hydrofield in China, such as Norway, France, Japan, Australia, give us a pretty tough run of things. Can you give us a few examples of the types of programs they have and what type of export financing they are able to provide?

Mr. Lawson. I think first and foremost is the feasibility study which we mentioned here and second is the offer of long-term interest rates, low interest, long-term rates that are highly competitive and attractive to the Chinese as they are to other countries in East Asia.

Third, I think there is a tendency by some of those countries, Japan in particular, to give official development assistance, but have some of that development assistance be tied. We don't do as much as the Japanese or Australians do in that regard, so in those three areas they clearly can afford, or give to their private sector an advantage that we do not give.

Mr. Bosco. Thank you, Mr. Lawson.

Mr. Chairman, if I may yield to Mr. Lent.

Mr. Swift. You certainly may. I recognize the gentleman from New York.

Mr. Lent. Thank you, Mr. Chairman.

I would like to ask you, Secretary Lawson, what is your view on the progress of including the private sector in annex II activities and has the private sector been satisfied so far?

Mr. Lawson. I think it is fair to say that the private sector is reasonably satisfied. We brought them in through a very lengthy and detailed consultation process when we were drawing up the language for annex II. During the negotiations with the Chinese we made sure that every time we mentioned the U.S. Government, the U.S. private sector was mentioned simultaneously.

As far as actual commercial return goes, no, I would say that the private sector is not yet satisfied. It is going to be a long process which will involve a great deal of patience on the part of the U.S private sector.

In the case of the one project that I mentioned before, Tianshengqiao, a U.S. private sector firm has done the feasibility study on that, and that project is moving along rather rapidly.

I would expect that within 6 months bids will go out on turbines and generators, and of couse, the engineering services that need to be done on that big project.

So there will be some rather immediate commercial return on that one project.

The other projects are large. Some of them are on paper. Some of them are moving from paper to implementation very slowly. So it is not going to be a very immediate payout for the U.S. industry here.

Mr. Lent. Do you think that any changes in American law are required to move this thing along?

Mr. Lawson. Well, I am not a legislator, but——

Mr. Lent. Is there some legal way that we can change any of our statutes to enhance the U.S. competitive position?

Mr. Lawson. Well, I thank you for that question, Mr. Lent. I would just reiterate that a basic problem that U.S. exporters face in doing business with China is the lack of adequate financing.

If there were some way to increase that, we would see trade with China develop very quickly and very rapidly.

Mr. LENT. Thank you, Mr. Chairman.

Mr. SWIFT. I thank the gentleman from New York.

I have one last question. You are currently negotiating a new protocol on telecommunications and we had a discussion earlier. It is a matter of particular interest to this committee.

Can you tell us what that protocol might involve and when it might be completed?

Mr. LAWSON. Let me answer the last part of that question first. We have now exchanged two different drafts of that protocol. I think we are closing in on the final agreed text.

In fact, the Deputy Under Secretary of Commerce, Olin Whetthington, is in China on a different mission, but he is going to raise this protocol again with the Chinese to move it along.

This is a rather typical protocol and involves the exchange of delegations and seminars. What we want is early identification of major project opportunities. We are trying to inject as much as we can, Mr. Chairman, commercial interests into these protocols and not merely have them government to government exchanges in which technical advice is freely given by us, but where we do not see any commercial payout. That is the purpose of this telecommunications protocol, to pinpoint projects, include the private sector, make it project specific and focus it on private sector activities.

Mr. SWIFT. How are you going to involve the private sector in this, and how are you going to select who in the private sector you would involve in this?

Mr. LAWSON. Well, again, we would work with the trade associations. Of course, we can't make distinctions among various competing firms.

So we normally approach the trade associations and they through their own process then pick various U.S. companies that would participate in the seminars and exchanges.

That, I think, is the fairest way to go about it.

Mr. SWIFT. Thank you very much.

Do the earlier members of the panel have anything that they would like to add to the most recent part of the discussion?

[No response.]

Mr. SWIFT. Thank you, all of you, for being here and helping the committee as we explore this important area.

Without objection, the protocols that are the subject of this hearing and appropriate related documents will be entered in the record.

Mr. LAWSON. Thank you.

[The information follows:]

RESPONSE BY
EUGENE K. LAWSON TO QUESTIONS
FROM THE SUBCOMMITTEE
ON U.S. TRADE WITH CHINA

QUESTION:

Please elaborate on the process of obtaining greater private sector involvement in Annex II of the Hydropower Protocol. Did this require special negotiations or agreements with the PRC? If so, would you provide unclassified records of the negotiations?

ANSWER:

The process of obtaining greater private sector involvement in Annex II to the Hydropower Protocol did not require special negotiations with the Chinese. Commerce officials met several times with private sector representatives to confirm that the private sector was interested in participating and to discuss the type of participation contemplated (basically, participation in delegation exchanges and seminars). We then informed the Chinese that we desired more private sector participation and wrote suitable provisions into our draft of Annex II. The Chinese did not object, so the provisions were incorporated in the final version of Annex II.

QUESTION:

Please provide a detailed review of the Department's role in arranging for and implementing the feasibility study for the Tianshengqiao project.

ANSWER:

In early February 1982, I met with his Chinese counterpart in Beijing to discuss future cooperation under the Hydropower Protocol. At that time, I suggested that in Annex II to the Protocol, the two sides concentrate on one Chinese priority project for which TDP might fund a feasibility study. Later that month, the Chinese informed our Embassy in Beijing that they would like to have TDP fund a feasibility study for the Tianshengqiao (TSQ) project. In late February, TDP agreed in principle to fund the study, and decided to go ahead with the feasibility study grant without waiting

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for Annex II to be finalized (drafts of Annex II were not exchanged until May, some three months later). TDP then went ahead with its negotiation of the TSQ grant, with the understanding that it would be incorporated in Annex II. The TDP grant agreement was signed on June 13, and Annex II was finally signed three months later, incorporating by reference the TDP grant agreement.

Commerce had no direct role in the actual negotiation and implementation of the TSQ feasibility study. TDP handled the negotiations, and the Corps' Seattle office oversaw implementation.

QUESTION:

Could you outline Chinese interests in negotiating for a protocol on telecommunications? For example, have they identified their development objectives for potential projects?

ANSWER:

Chinese interests in cooperation with the U.S. under a telecommunications protocol fall into the following general areas keyed to specific objectives for improving and upgrading their telecommunications system:

- Long range planning - Network analysis and network engineering, especially software simulation;
- Intercity distribution system - U.S. experience in fiber optics, especially the Chicago and Atlanta early-on tests;
- Intra-city systems - U.S. application of fiber optics technology (especially installation of fiber optics in the northeast corridor system from Boston to New York to Philadelphia, and on to Washington).
- Network design - Most cost effective mix of microwave, fiber optics, and satellite components.

The United States has proposed that the first annex to the telecommunications protocol set the stage for immediate future cooperative activities under the terms of the basic protocol.

Under the terms of the proposed annex we would, for the first time, send a team of expert government and industry telecommunications technicians, planners and engineers to study China's scientific and technological development in telecommunications and perform a subsequent economic and management analysis of China's telecommunication needs.

The analysis could be completed within six months of the visit and would include specific recommendations. These recommendations would form the basis for discussion of follow-on agreements that would include participation by private as well as government organizations.

In general, the Chinese appear to have established the following objectives for development of their telecommunications system:

(1) improving local telephone service, especially in the big cities;

(2) further development of the toll telephone system;

(3) increase in trunk lines, both local to toll, and long distance;

(4) installation of automatic toll systems in provincial capitals;

(5) establishment of a test office for international trunks;

(6) upgrading of Beijing, Shanghai and Guangzhou to all-automatic and semi-automatic service;

(7) replace open wire with cable and microwave.

QUESTION:

What is the current status of the translation program under the protocol annex administered by the National Technical Information Service? What plans exist to expand this program? How much would it cost to provide good quality translations of the most useful Chinese and Japanese texts?

ANSWER:

> The translation program included in the protocol annex administered by the National Technical Information Service (NTIS) is no longer active. The program was a component of an overall foreign technical information acquisition effort which received appropriated funding during the years 1981-83. The acquisition effort is now being maintained at NTIS on a smaller, strictly cost-recovery basis. (Note that, except for an occasional appropriation intended for a specific project, all NTIS operations are self-supporting.) Experience has shown that NTIS can never recover the costs of high quality technical translation work, so that this program component is no longer being pursued. It is estimated that a translation program would cost approximately $100,000 per 200 Chinese- and Japanese-language technical documents translated. The figure includes the cost of document acquisiton, of translation and reproduction rights, translation work, technical editing, reproduction, and dissemination to U.S. users. Part of the costs could be recovered through the sale of the translated documents.

Mr. SWIFT. The next two witnesses are Dr. James E. Leiss, Assistant Director of High Energy and Nuclear Physics, Department of Energy, and Mr. Bernard A. Ramundo, Chief, International Cooperation Division, U.S. Department of Transportation.

Come forward. We will take you in the order that I indicated. First, Dr. Leiss and then Mr. Ramundo. We will have you each present your testimony and then we will ask you questions. The formal portion of your testimony will be made a part of the record, without objection; you may proceed as you wish, Dr. Leiss.

STATEMENT OF JAMES E. LEISS, ASSOCIATE DIRECTOR OF HIGH ENERGY AND NUCLEAR PHYSICS, OFFICE OF ENERGY RESEARCH, U.S. DEPARTMENT OF ENERGY, WASHINGTON, D.C.

Dr. LEISS. Thank you, Mr. Chairman.

I am pleased to appear before you today to discuss the Department of Energy's activities under the protocols of the 1979 Science and Technology Cooperation Agreement with the People's Republic of China [PRC].

I will discuss two protocols: one on "High Energy Physics" and the other, very recently signed, on "Cooperation in the Fields of Nuclear Physics and Controlled Magnetic Fusion Research."

On January 31, 1979, the U.S. Government signed an agreement with the People's Republic of China [PRC] on Cooperation in Science and Technology. The first implementing accord under that agreement was for cooperation in the field of high energy physics and it was signed on the same date.

The U.S./PRC Joint Committee on High Energy Physics, established under the terms of the implementing accord and chaired jointly by Dr. James E. Leiss, Associate Director for High Energy and Nuclear Physics, Department of Energy, for the United States and by Prof. Zhang Wenyu, Director of the Institute for High Energy Physics for the PRC, had its first meeting in Beijing on June 10 to June 12, 1979. At that time a 1979-80 joint program of work and a patent-copyright annex to the implementing accord were negotiated and signed and went into effect at that time.

Cooperative work in high energy physics research between U.S. and PRC scientists and engineers has continued since 1979.

The joint programs of work have included tasks covering a wide range of activities in high energy physics research. However, most of the work has been focused on research and development and design for a high energy physics accelerator facility to be constructed in Beijing by the PRC scientists.

The goal of the Chinese has been to initate a viable national high energy physics program by training a cadre of competent high energy physicists and designing, constructing, and operating an appropriate research facility near Beijing.

Originally, this was to be a 50-GeV proton synchrotron. Because of financial stringencies, the PRC found it necessary to postpone indefinitely the 50-GeV synchrotron and to refocus the immediate program for high energy physics on a more modest goal.

After considerable study and discussion, it was decided to concentrate the effort on the design and construction of an electron-positron colliding beam facility [BEPC] which would be an improved version of the U.S. SPEAR facility, built about 10 years ago at the Stanford Linear Accelerator Center, Palo Alto, Calif.

BEPC will initially have 2.1 GeV energy in each beam. The BEPC project will include an electron linear accelerator operating in the energy range 1.1 to 2.4 GeV, a ring of magnets for storage and collision of the electron and positron beams with each other, and a state-of-the-art detector apparatus for study of the results of the collisions.

The central task of the current program of work—agreed to at the March 1982 meeting—is to complete the design of the BEPC facility. The PRC's design team of 16 scientists and engineers visited SLAC from mid-June until late September 1982 and has completed the conceptual design effort.

The People's Republic of China scientists and engineers involved in the program of work are bright, hard working, and dedicated to advancing research. The history of basic research provides many examples which indicate that in the long run the People's Republic of China entry into the main stream of research in high energy physics will be highly beneficial to the world's progress in this field and, therefore, also of overall benefit to the U.S. program.

From the beginning of the United States-People's Republic of China cooperation in high energy physics, it was realized within the Department of Energy that monitoring and control of the exchange of people, information, and equipment would be needed. Before the first meeting of the United States/People's Republic of China JCC-HEP at which it was agreed to do joint work on the Beijing proton synchrotron project, DOE organized a meeting in Washington, D.C., between appropriate representatives of various U.S. departments and agencies, including the Department of Commerce and the Department of Defense, to describe the project and identify issues related to the expected exchange.

Procedures satisfactory to the various participants were worked out as a result of that meeting and subsequent discussions. When the People's Republic of China made substantial changes in the program in 1982, we got together with the various agencies involved in technology transfer issues, used the experience that we had gained in how to make technology transfer and export licensing work, and developed improved procedures with the cooperation of the other agencies and then agreed to those procedures at the next meeting of our joint committee. I think that has helped in what has been an annoying problem in carrying out the cooperation on these programs.

It should be noted that the joint work has followed a principle that the benefitting side pays. Therefore, the People's Republic of China who has been the primary beneficiary technically has paid the cost when it was appropriate.

Overall, we believe the U.S. considers that the collaboration has been beneficial.

The second protocol for cooperation in the field of nuclear physics and controlled magnetic fusion is a new agreement signed in Beijing on May 11 of this year. Final agreement concerning protection of copyrights and patents will be made an annex to this protocol.

A working group established under the protocol to coordinate the activities is cochaired on the U.S. side by Dr. Alvin W. Trivelpiece, Director of Energy Research, Department of Energy, and on the People's Republic of China side by Jia Weiwen, Commissioner, Director, Department of Coordination for Specially Promoted Projects, SSTC.

While most of the work in the high energy physics cooperative program has been focused on research, development, and design for a high energy physics facility to be constructed in the People's Republic of China, the emphasis in the cooperative program in Nuclear physics and controlled magnetic fusion research will focus on a number of smaller efforts such as assignments of scientists to specified laboratories for both short- and long-term periods, specific joint research studies, and joint workshops and laboratory tours. The detailed program of work developed from initial discussions between the involved laboratories in the two countries.

I would like to turn now to the broader question of how the work under these protocols relate to, or contribute to improved trade opportunities for the United States with the People's Republic of China. The basic research areas involved—high energy physics and nuclear physics—are, after all, long-term fundamental research programs where the main payoff to society is generally expected to occur only after many years. Although magnetic fusion energy research and development is an applied program aimed at a precise goal, its payoff is also expected to occur only after many years. I would like to assert, however, that these cooperative programs and other research collaborations with PRC have a great deal to do with fostering a climate for improved trade opportunities for the United States.

There is no question that the People's Republic of China represents a vast potential market of demand for many products. However, the ability to turn that potential into trade opportunities depends upon many factors.

These include the ability of the People's Republic of China economy to absorb this trade, the development of a high technology component of the People's Republic of China industry and culture which is receptive to our high technology products, the fostering of social stability within the People's Republic of China which comes with improved quality of life for its citizens, and very importantly the mutual respect and understanding between the People's Republic of China and the United States which comes from our cooperatively working together in research and in other ways.

I believe that these cooperative programs and others under the 1979 science and technology cooperation agreement contribute to these important conditions required for good trade relations between our nations.

Mr. Chairman, that concludes my testimony. I would be pleased to respond to any questions you might have.

[The statement of Dr. Leiss follows:]

Statement of James E. Leiss
Associate Director for High Energy and Nuclear Physics
Office of Energy Research
Department of Energy

Special Subcommittee on U.S. Trade with China
House Committee on Energy and Commerce

October 31, 1983

I am pleased to appear before you today to discuss Department of Energy activities under the protocols of the 1979 Science and Technology Cooperation Agreement with the People's Republic of China. I will discuss two protocols: one on High Energy Physics and the other, very recently signed on Cooperation in the Fields of Nuclear Physics and Controlled Magnetic Fusion Research. I will first briefly present the history and status of these two protocols and activities under them, and then discuss my views on how activities under these protocols contribute toward improved trade opportunities for the United States.

On January 31, 1979, the U.S. Government signed an Agreement with the People's Republic of China (PRC) on Cooperation in Science and Technology. The first implementing Accord under that Agreement was for cooperation in the field of high energy physics and was signed on the same date.

The US/PRC Joint Committee on High Energy Physics, established under the terms of the Implementing Accord and chaired jointly by Dr. James E. Leiss, Associate Director for High Energy and Nuclear Physics, Department of Energy, for the U.S. and by Professor Zhang Wenyu, Director of the Institute for High

Energy Physics for the PRC, had its first meeting in Beijing June 10-12, 1979. At that time a 1979 - 1980 Joint Program of Work and a patent-copyright Annex to the Implementing Accord were negotiated and signed.

Cooperative work in high energy physics research between U.S. and PRC scientists and engineers has continued since 1979. The second meeting of the US/PRC Joint Coordinating Committee on High Energy Physics (US/PRC JCC-HEP) was held in the U.S. at Fermilab, Batavia, Illinois, on June 17-19, 1980. In 1982, Professor Qian Sanqiang, Associate Director of the Chinese Academy of Science, replaced Professor Zhang Wenyu as co-chairman of the Committee. The Committee met in Beijing, People's Republic of China, on March 8-9, 1982.

The joint programs of work have included tasks covering a wide range of activities in high energy physics research. However, most of the work has been focused on research and development and design for a high energy physics accelerator facility to be constructed in Beijing by the PRC.

The goal of the Chinese has been to initiate a viable national high energy physics program by training a cadre of competent high energy physicists and designing, constructing, and operating an appropriate research facility near Beijing. Originally this was to be a 50-GeV proton synchrotron. Because of financial stringencies, the PRC found it necessary to postpone indefinitely the 50-GeV synchrotron and to refocus the immediate program for high energy physics on a more modest goal. After considerable study and discussion, it was decided to concentrate the effort on the design and construction of an electron-positron colliding beam facility (BEPC) which would be an improved version of the U.S. SPEAR facility, built about 10 years ago at the Stanford Linear Accelerator Center, Palo Alto, California. BEPC will initially have 2.1 GeV energy in each beam. It is being designed so that it could go to higher energies in the future. The BEPC project will include an electron linear accelerator operating in the energy range 1.1 to 2.4 GeV, a ring of magnets for storage and collision of the electron and positron beams with each other, and a state-of-the-art detector apparatus for study of the results of the collisions.

The central task of the current program of work (agreed to at the March 1982 meeting) is to complete the design of the BEPC facility. The PRC's design team of 16 scientists and engineers visited SLAC from mid-June until late September 1982 and has completed the conceptual design of the linac and the collider ring. The PRC scientists and engineers involved in the program of work are bright, hard working, and dedicated to advancing research in high energy physics. The history of basic research provides many examples which indicate that in the long run the PRC's entry into the main stream of research in high energy physics will be highly beneficial to the world's progress in this field and, therefore, also of overall benefit to the U.S. program.

From the beginning of the US/PRC cooperation in high energy physics, it was realized within the Department of Energy that monitoring and control of the exchange of people, information, and equipment would be needed. Before the meeting of the US/PRC JCC-HEP at which it was agreed to do joint work on the Beijing Proton Synchrotron project, DOE organized a meeting in Washington, D.C., between appropriate representatives of various U.S. departments and agencies including the Department of Commerce and the Department of Defense, to describe the project and identify issues related to the expected exchange. Procedures satisfactory to the various participants were worked out as a result of that meeting and subsequent discussions.

After it was clear that the PRC had decided to change to the plan to build the electron-positron collider, which employs somewhat different technology, a second interagency meeting was held to provide the interested parties with the latest information and to identify special characteristics of the electron-positron collider. At this time, and based on the experience accrued in the first three years of the US/PRC cooperation, a new set of detailed procedures for processing export licenses and handling technology transfer were worked out and discussed. Subsequently, the new procedures were presented and agreed to at the 1982 meeting of the US/PRC joint committee. Building on established procedures of the Departments of Commerce and Energy, the new procedures provide that detailed end-use information and corresponding equipment lists identified by a PRC assigned control number be provided to DOE/High Energy Physics program managers and national laboratory collaborators at the time of submitting export license applications to the Department of Commerce. This procedure has further reduced the license processing time.

It should be noted that the joint work has progressed following the principle that the "benefitting side pays." The PRC side has been the primary beneficiary technically, and has paid the costs when appropriate. The U.S. side has considered that the collaboration has been beneficial overall.

The Protocol for Cooperation in the Fields of Nuclear Physics and Controlled Magnetic Fusion Research is a new agreement, signed in Beijing on May 11, 1983. Final agreement concerning protection of copyrights and patents will be made an Annex to this protocol.

A Working Group established under the protocol to coordinate the activities is co-chaired on the U.S. side by Dr. Alvin W. Trivelpiece, Director of Energy

Research, Department of Energy, and on the PRC side by Jia Weiwen, Commissioner, Director, Department of Coordination for Specially Promoted Projects, SSTC.

While most of the work in the high energy physics cooperative program has been focused on research, development, and design for a high energy physics facility to be constructed in PRC, the emphasis in the cooperative program in Nuclear Physics and Controlled Magnetic Fusion Research will focus on a number of smaller efforts such as assignments of scientists to specified laboratories for both short- and long-term periods, specific joint research studies, and joint workshops and laboratory tours. The detailed program of work developed from initial discussions between the involved laboratories will be coordinated and agreed to by the Joint Working Group established in the Protocol.

I would like to turn now to the broader question of how the work under these protocols relate to or contribute to improved trade opportunities for the United States with the PRC. The basic research areas involved--High Energy Physics and Nuclear Physics--are, after all, long-term fundamental research programs where the main payoff to society is generally expected to occur only after many years. Although magnetic fusion energy research and development is an applied program aimed at a precise goal, its payoff is also expected to occur only after many years. I would like to assert however that these cooperative programs and other research collaborations with PRC have a great deal to do with fostering a climate for improved trade opportunities for the U.S.

There is no question that the People's Republic of China represents a vast potential market of demand for many products. However, the ability to turn that potential into trade opportunities depends upon many factors. These include the ability of the PRC economy to absorb this trade, the development of a high technology component of the PRC industry and culture which is receptive to our high technology products, the fostering of social stability within PRC which comes with improved quality of life for its citizens, and very importantly the mutual respect and understanding between PRC and the United States which comes from our cooperatively working together in research and in other ways. I believe that these cooperative programs and others under the 1979 Science and Technology Cooperation Agreement contribute to these important conditions required for good trade relations between our nations.

Mr. Chairman, that concludes my testimony. I would be pleased to respond to any questions you might have.

Mr. SWIFT. Thank you very much, Dr. Leiss. I think we will hear from Mr. Ramundo first and then ask questions of you both.

STATEMENT OF BERNARD A. RAMUNDO, CHIEF, INTERNATIONAL COOPERATION DIVISION, OFFICE OF INTERNATIONAL POLICY AND PROGRAMS, U.S. DEPARTMENT OF TRANSPORTATION, WASHINGTON, D.C.

Mr. RAMUNDO. Mr. Chairman, it is a pleasure to represent the Department of Transportation before your subcommittee.

In the interest of conserving time and leaving more time for questions and to hit upon those points that seem to me to be of greater interest to the subcommittee, I am going to skip around my prepared statement taking cognizance of the fact that it will appear in its entirety in the record.

My responsibilities in the Office of the Secretary of Transportation include management of the Department of Transportation's international cooperation program.

The purpose of the progam is to gain access to foreign transportation experience and research for the solution of our own transportation problems, thereby conserving DOT resources. The program also serves to support U.S. foreign policy objectives through cooperative and reimbursable technical assistance activities with partners other than those whose experience or technology is of special interest to the department.

Another benefit of the program is to stimulate the sale of U.S. transportation technology as a result of the exposure it receives in connection with cooperative activities. As a consequence, we consider the foreign sales aspect a collateral objective of the program. This includes facilitative assistance to the private sector, through the showcasing of U.S. technology, and making contact for it with key foreign transportation officials who become known to us through our cooperative activities.

The department has cooperative arrangements with 30 foreign governments and international organizations, including the one recently concluded with the People's Republic of China.

As you are aware, we are sort of one of the new kids on the block in the sense that our protocol was concluded at the Joint Commission meeting in May. My prepared statement describes the manner in which we conducted these negotiations.

Let me just highlight four or five points here.

First of all, we entered into this dialog principally because we thought we could make a contribution to the normalization process in the sense that transportation was an important element in the modernization program of the PRC and we thought we had something we could offer in this regard.

We also thought that because of the centrality of transportation to the modernization effort, there would be a way that we could, in effect, contribute to the realization of our collateral objective and promote the sale of U.S. equipment and technology.

You must bear in mind that the negotiation of this protocol took 3 years and that only part of the delays were bureaucratic. Part of the delays represented the state of health of the political relationship between the United States and the PRC and this is something that should be taken into account when you think about private sector interest in pursuing or commercial possibilities with the PRC.

We made it very clear to the Chinese that we are one of those domestically oriented agencies that do not have funding for international cooperative activities and that basically we foresaw a program that would involve exchanges of information, exchanges of delegations and no real hard project activity because of the disparity of the interests on both sides.

During the course of the dialog, it was clear that the Chinese were very interested in cooperating with the Corps of Engineers, the U.S. Army Corps of Engineers. They had been exposed to some of the work of the Corps of Engineers and because of their priority interests in certain areas which are within the special expertise of the corps, the Chinese requested and we agreed, with the approval of the Corps of Engineers to include the corps under the transportation protocol. So you have the Corps of Engineers as a junior partner in those areas that pertain to its expertise.

We are one of the agencies that conducted the negotiations directly with the PRC. I conducted those negotiations for the United States.

The transportation protocol was signed in May of this year. We are at the point that we have exchanged with the Chinese, in accordance with the terms of the protocol, the senior level points of contacts for each side. So you might say we are poised to get started, but really have not done much.

Now, let me comment briefly about the nature of cooperative activities that we contemplate, and some of the areas we will be involved in. Then I would like to make a statement concerning the trade opportunities as we see it and thereafter I will be available for whatever questions the subcommittee may have.

The protocol provides for cooperative activities in the areas of highway engineering, shipping management, traffic management systems, port engineering, marine and urban transportation, and other areas as mutually agreed.

You will note that the railroad area is not included and this is something that developed during the negotiations. When we first started the negotiations, the Chinese wanted two protocols because they do not have a DOT that is multimodal. On the Chinese side there are two counterparts to DOT: one for railroads and one for communications. When we made it very clear to the Chinese that, because of funding and personnel constraints we would be basically in the business of exchanging information and delegations, they elected to conclude only one protocol with the idea that the railroad area, if it were to be included, would be added later. In other words, the initial effort on the Chinese side to have two partners for DOT did not materialize.

As indicated earlier, we anticipate that our initial cooperative activities will be in the form of information and delegation exchanges. We have already received several delegations. In the interest of furthering the cooperative relationship, we hosted, arranged and coordinated a multicity, month-long visit program for a nine-member, senior-level PRC transportation delegation last January. The visit included meetings with all elements of the Department, other Government agencies and private industry. We are pretty much constrained to get private industry groups involved not only because of Chinese interests, but also because they help pay part of the hosting bill. This summer, the Corps of Engineers hosted a water transportation-oriented delegation.

We anticipate only limited transfers of technology under the program. Our primary objective is to participate in the government-level S&T program in support of U.S. foreign policy objectives and to promote the sale of U.S. transportation technology and experience.

We feel the potential in this latter regard is good because of the Chinese modernization effort and the importance of transportation to it. From the very outset of the dialog, departmental specialists have participated in private sector delegation visits to the PRC.

There are, however, some aspects of the relationship which have a potentially negative impact on realization of the trade potential. The length of time it took to conclude the negotiation—born of political and bureaucratic delays—and the onset of the recession resulted in some loss of private sector interest in becoming involved in the cooperation program.

Fiscal constraints impacting both travel and cooperative activity on both sides also take its toll. DOT is primarily a domestically oriented technical agency which has no funds for general international cooperative activities, including trade promotion. Money for specific cooperative activities comes out of project funds when it is clear to the manager of those funds that a technical benefit will result from participation in the activities.

The lower level of expectation concerning technical benefit from cooperation with the PRC has resulted in little or no funding available for the cooperative program. In the case of the PRC, the cutbacks and delays in the modernization program and the high front-end costs of doing business with China has dampened some of the private sector's earlier expectations concerning the commercial possibilities.

Thank you, Mr. Chairman.

[The statement of Mr. Ramundo follows:]

DR. BERNARD A. RAMUNDO
CHIEF, INTERNATIONAL COOPERATION DIVISION AND SECRETARIAT

TESTIMONY BEFORE THE HOUSE SPECIAL SUBCOMMITTEE ON U.S. TRADE WITH CHINA

My responsibilities in the Office of the Secretary of Transportation include management of the Department of Transportation's (DOT) International Cooperation Program.

The purpose of the Program is to gain access to foreign transportation experience and research for the solution of our own transportation problems, thereby conserving DOT resources. The Program also serves to support U.S. foreign policy objectives through cooperative and reimbursable technical assistance activities with partners other than those whose experience or technology is of special interest to the Department. Another benefit of the Program is to stimulate the sale of U.S. transportation technology as a result of the exposure it receives in connection with cooperative activities. As a consequence, we consider the foreign sales aspect a collateral objective of the Program. This includes facilitative assistance to the private sector, through the showcasing of U.S.

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technology, and making contact for it with key foreign transportation officials who become known to us through our cooperative activities. The Department has cooperative arrangements with 30 foreign governments and international organizations, including the one recently concluded with the People's Republic of China (PRC).

BACKGROUND

As part of the "normalization" process with the PRC, DOT was requested by the Department of State and the White House Office of Science and Technology Policy to participate in the U.S.-PRC Science and Technology (S&T) Program. The Department initiated the cooperation dialogue in December 1979 by proposing activities in the form of exchanges of technical information, visits of specialists on a sending-side-pays basis, and reimbursable technical assistance in the areas of special interest to the People's Republic of China: highways, inland waterways, railroads, ports, and civil aviation. A draft protocol was submitted to the People's Republic of China in July 1980 and a proposal suggesting a scenario in accordance with which a DOT delegation would visit the People's Republic of China to advance the dialogue and a PRC delegation would make a return visit during which the protocol would be concluded. The Chinese did not respond until May 1981, when they submitted their draft proposals and stated their readiness to receive the DOT delegation as we had proposed. They also indicated their special desire to have the U.S. Army Corps of Engineers participate in the program because of the PRC's interest in water transport and port development. The Corps agreed and was included as one of the cooperating entities for the U.S. side.

DOT had difficulties with several aspects of the Chinese proposal. The PRC sought to have all delegation travel funded on the basis that the receiving side bears all expenses except for the international travel portion. DOT could not accept this provision since it does not have the funds to handle delegation exchanges on other than the sending-side-pays basis. The PRC also asked that technical teams be composed of seven/eight experts for one to three months visits per project. The Department cannot afford to send or receive such large delegations for such extended periods. Finally, the PRC called for the elimination from the draft of an express undertaking to reimburse DOT for technical assistance. DOT did not intend, nor could it afford, to provide non-reimbursed technical assistance to the Chinese.

To assure that costly delegation visits would not be made if our difficulties with the PRC draft were to prove insurmountable, we requested that the situs of the negotiations be shifted to Washington. The Chinese agreed and it was my pleasure to represent the United States in working out the terms of the Transportation Protocol. During the period September 21 - October 1, 1981, we were able to favorably resolve major issues of principle. On the basis of DOT's fiscal and personnel constraints, we sought and obtained Chinese agreement that initial cooperation would be quite modest, consisting primarily of information and delegation exchanges. The Chinese also accepted the DOT position which rejects the principle of receiving side pays. The DOT position on reimbursable technical assistance was accepted by the Chinese and it was agreed that conditions concerning funding of specific activities would be covered in project arrangements.

In February 1983, at the Chinese request, a meeting was held in Washington to finalize negotiations of the Protocol. On May 11, 1983, the Protocol was signed in Beijing and both countries have appointed representatives to coordinate the cooperative activities to be carried out under the Protocol.

COOPERATIVE ACTIVITIES

The Protocol provides for cooperative activities in the areas of highway engineering, shipping management, traffic management systems, port engineering, marine and urban transportation, and other areas as mutually agreed. As indicated earlier, we anticipate that our initial cooperative activities will be in the form of information and delegation exchanges.

In the interest of furthering the cooperative relationship, we hosted, arranged and coordinated a multi-city, month long visit program for a nine-member, senior-level PRC transportation delegation last January. The visit included meetings with all elements of the Department, other government agencies and private industry. This summer, the Corps of Engineers hosted a water transportation-oriented delegation.

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TRADE OPPORTUNITIES

We anticipate only limited transfers of technology under the program. Our primary objective is to participate in the government-level S&T program in support of U.S. foreign policy objectives and to promote the sale of U.S. transportation technology and experience. We feel the potential in this regard is good because of the Chinese modernization effort and the importance of transportation to it. From the very outset of the dialogue, departmental specialists have participated in private sector delegation visits to the PRC.

There are, however, some aspects of the relationship which have a potentially negative impact on realization of the trade potential. The length of time it took to conclude the negotiation (born of political and bureaucratic delays) and the onset of the recession resulted in some loss of private sector interest in becoming involved in the cooperation program. Fiscal constraints impacting both travel and cooperative activity on both sides also take its toll. DOT is primarily a domestically-oriented technical agency which has no funds for general international cooperative activities, including trade promotion. Money for specific cooperative activities comes out of project funds when it is clear to the manager of those funds that a technical benefit will result from participation in the activities. The lower level of expectation concerning technical benefit from cooperation with the PRC has resulted in little or no funding available for the cooperative program. In the case of the PRC, the cutbacks and delays in the modernization program and the high front-end costs of doing business with China has dampened some of the private sector's earlier expectations concerning the commercial possibilities.

Mr. SWIFT. Thank you very much, both of you.

Mr. Ramundo, you are going to have to help me out a little bit. I don't in any way mean to be critical of the Department of Transportation, let alone you, but it is clear that you have got some real bad funding problems keeping you from participating in these programs with China. I am wondering if this is generic to all agencies other than State and Commerce or whether there is something unique about the Department of Transportation?

You went in to the negotiations saying we can only exchange information and people. We can't do anything else beyond that because we don't have any money for it.

Did you send somebody to Beijing to sign the protocol?

Mr. RAMUNDO. No, sir. It was signed in Beijing. In the course of the negotiations, the negotiations were conducted in Washington principally because we did have a funding problem. The Chinese were kind enough to send their people here and we concluded the negotiations here.

With respect to your first question, the problem is generic and Mr. Horner pointed that out, that the technical agencies because of their domestic orientation do not generally have line item funding for international cooperative activities. Unless there is technical payoff that can be, in effect, properly included under a project or a program budget, there just wouldn't be any funding.

Mr. SWIFT. Then if that is a generic situation, then don't we have a generic problem? In other words, it was also made fairly clear by Mr. Horner that State is limited in what it can do in its coordinating capacity.

They can't come down there and tell you what to do, and they should not be able to. On the other hand, you don't have the funding.

Are you saying you don't have the statutory authority to spend money on that or are you saying you just don't have funding?

Mr. RAMUNDO. We don't have the funding for it.

Mr. SWIFT. So you can't take the initiative. So if we want to be active in international affairs, if we want to be active with the Chinese in transportation matters, then something has to give, right? You are telling me you are not able to do this beyond just talking to each other, right?

Mr. RAMUNDO. We are not able to be actively involved in trade promotion. We have done so much research and we have so much material that would be of interest to the Chinese that, in effect, we can participate meaningfully in the program from the standpoint of being responsive to Chinese interests and do it on the cheap, so to speak.

Mr. SWIFT. How could you coordinate with Commerce which has some trade promotion capability? If I am the president of a U.S. firm manufacturing transportation equipment of one sort or another and I want to get involved with China, do I come to you?

Mr. RAMUNDO. You would come to me because you know that we have a protocol and then we would see what would be available over at Commerce. The other thing that we could do is provide some facilitative assistance in terms of passing on to the U.S. firm any information we have concerning Chinese interests and any shopping lists they may have; put them in touch with important Chinese counterparts, so that in effect they don't spend all their time in the hotel rooms trying to make those initial contacts. That is what we can do and we do that in the programs we have with more than 30 countries.

Mr. SWIFT. What I presume you are telling me is that this is not only true of the Department of Transportation, but it would be true of many other domestic agencies that have no funds set aside specifically for bilateral agreements?

Mr. RAMUNDO. I think that is the general situation and I believe that is also the situation with respect to the Corps of Engineers.

Mr. SWIFT. Well, we mentioned earlier with Mr. Horner that sometimes the way we do business is perplexing to the Chinese.

Mr. RAMUNDO. This might be another one of those.

Mr. SWIFT. I was going to say we have the State Department and the Commerce Department with some external authority for these programs and the budget to implement it. They, however, can't be telling you and other agencies how to handle your business. But when we get to you, you don't have the funding to be able to facilitate, and so you turn around and simply go back to where the Chinese started from.

That seems like it would be a very confusing way to do business, not only for the Chinese but for our industries as well, would it not?

Mr. RAMUNDO. Well, the Department of Commerce has the functional responsibility for trade promotion. That is not a responsibility of the Department of Transportation. Because we are all part of the team and have an interest in reducing trade deficits, we have assumed as a collateral objective the promotion of trade.

Mr. SWIFT. What could you do under law, given your mission, if you had more money for international activities?

Mr. RAMUNDO. Well, we could do some of the things that I judge from listening to what I have heard this morning that you would like us to do, such as feasibility studies and more active trade promotion. It is not a question that we suffer from a disability in the sense that, legally speaking, these activities would be ultra vires. It is a question of funding.

Mr. SWIFT. You have the authority, you say?

Mr. RAMUNDO. No question about that.

Mr. SWIFT. But you have no funding for that particular purpose?

Mr. RAMUNDO. Right. In other words, unless there is a technical benefit, we have no funding for international cooperative activities. There is no seed money.

Mr. SWIFT. All right. Do you think you should have some seed money?

What I am trying to get at here is, what is the attitude of the Department of Transportation with regard to that if we were to trundle along and say, "Hey, we really think you should have more money for these activities," and we try to get you some money for that. Would you be likely to go over to appropriations and say, "We really don't want that money?"

I am not talking about OMB because I know they don't want you to have any money for anything.

Mr. RAMUNDO. I can't conceive of that happening in any agency.

Mr. SWIFT. You feel you would be prepared to accept that money and spend it and do good things with it vis-a-vis China trade if you could get the money?

Mr. RAMUNDO. We would do good and do well, sir.

Mr. SWIFT. I am very happy to hear that.

I am going to recognize the gentleman from Minnesota. I may return to some of these questions.

Mr. SIKORSKI. Mr. Leiss, why is the patent clause not a part of the new protocol?

Dr. LEISS. Sir, the development of agreement on patent clauses is the touchiest, most difficult part of all of these agreements.

Mr. SIKORSKI. That is why I raised it.

Dr. LEISS. The high energy physics agreement was signed originally and we then negotiated the patent clause the following summer. We have been hung up on the nuclear physics and controlled magnetic fusion accord for approximately 2 years over the patent clause.

I think the fundamental difficulty is that the Chinese do not have as much experience in the area of developing international patent and intellectual property accords as do the United States and other countries. Therefore, they are essentially feeling their way.

Now, we developed what we think are very good patent and intellectual property clauses in the high energy physics accord, and we tried to convince them that those were, in fact, excellent clauses to put in the nuclear physics and magnetic fusion protocol. We still believe that is correct, but due to essentially inadequate coordination among the U.S. agencies that are developing these different protocols, a different patent clause crept in in one of the accords, which we find is very difficult for us to accept because it would serve as a precedent that would cause us great difficulty elsewhere in the world.

Mr. **Sikorski**. Who negotiated them?

Dr. **Leiss**. I believe that was an accord negotiated by the National Science Foundation.

Mr. **Sikorski**. And that gives us problems with other countries in terms of American properties?

Dr. **Leiss**. I don't believe it would give the National Science Foundation problems to the same extent as it would give the Department of Energy problems, and that is why we have great difficulty; because there are many other accords that are much more trade and commercial competitive oriented that the Department of Energy has with European countries, for example. It would create great difficulty if that precedent were sitting there. So, that is the reason why we have the difficulties now.

Mr. **Sikorski**. There is some hope we will go back to the original language or something akin to the language in the other protocol?

Dr. **Leiss**. I think we will end up with a compromise somewhere in between, if my experience is a good judge.

Mr. **Sikorski**. How soon?

Dr. **Leiss**. That I am not prepared to say.

Mr. **Sikorski**. Based on your experience, what would you guess?

Dr. **Leiss**. I would hope that within the next few months we would be able to go with a proposed program, patent experts, and try to hammer out a final agreement as we did in the initial agreement. But it is very hard to be sure on these things.

Mr. **Sikorski**. You talked in your statement of the long term. What is the long-term prospects for China's energy development, say 25 or 30 years?

Dr. **Leiss**. Well, it is a little bit hard to know how to answer that. They have a very large population that has been getting along on a rather low per-capita energy consumption. And as they are trying to modernize in many ways, I think it is almost inevitable that the energy use per individual is going to rise along with the other aspects of quality of life.

They are going to have to have a really and truly massive improvement of their energy resources, probably as fast as their skills and economy will allow them to make that expansion. That will use the various resources they have, which is probably relatively well matched with those of the United States.

Mr. **Sikorski**. They have historically used wood and fibers that have created some environmental and economic difficulties, in the sense that they have serious erosion and other problems associated with that.

Dr. **Leiss**. Yes; that is true.

Mr. **Sikorski**. Looking at the high energy physics protocol, there is a great deal of computer training involved with the Chinese, as I understand it.

Dr. **Leiss**. Yes.

Mr. **Sikorski**. Are there other applications of that training?

Dr. **Leiss**. I would like to make a somewhat long answer to you, but I think it is pertinent.

If you will look at countries that are trying to develop a high technology capability throughout the world, they have put high-energy physics research fairly high on their agenda in trying to develop this capability. And I don't think that is by accident.

First, it is an intellectual stimulation of their brightest people. But if you look at what is involved in building a large, high energy physics research facility of the class that one builds nowadays, you have to have it develop a capability in so many areas of science and technology that essentially the development of the capability to build such a facility almost guarantees that you have mastered a very broad set of sciences and engineering disciplines.

I think it has been valuable in that way. I think the leadership of China very much appreciates just exactly that point.

Mr. SIKORSKI. With that point, in looking at the new protocol and nuclear physics research, are we in any way compromising our policies on the transfer of nuclear technology?

Dr. LEISS. No.

First, in my testimony I made a point of describing to you what I think is a very responsible job that we have done in making sure that we set up good procedures for handling technology transfer questions and had the various agencies that had interests involved before we ever started the programs, and we have updated them as we went along.

The nuclear physics and magnetic fusion accord, in the case of nuclear physics, is almost exclusively for basic research in the study of the nucleus. Certainly that is the science that is behind nuclear energy, but of course, building nuclear energy plants involves a great deal more than that.

Mr. SWIFT. Would the gentleman yield on that point?

Mr. SIKORSKI. Yes.

Mr. SWIFT. What agency has the overall oversight responsibility on nuclear issues vis-a-vis our international obligations such as the Nuclear NonProliferation Treaty?

Dr. LEISS. I believe the Department of Energy has primary responsibility for many aspects of international nuclear nonproliferation. Certainly the Nuclear Regulatory Commission has responsibilities, and of course, the overall export license responsibility resides with the Department of Commerce.

Mr. SWIFT. I thank the gentleman for yielding.

Mr. SIKORSKI. I thank the gentleman for that good question.

The answer, then, we no way jeopardize those U.S. policies?

Dr. LEISS. Not in my opinion, sir.

Mr. SIKORSKI. The subcommittee investigation of the full Committee on Energy and Commerce has some real concerns about how DOE secures U.S. nuclear facilities. I would like you in the context of this morning's meeting to tell us how you address security with regards to visitors and visits at those facilities.

Dr. LEISS. We have to differentiate what kinds of facilities we are talking about. A great deal of our programs are carried out in universities, and this is all unclassified research. They operate in the normal university environment.

We have several national laboratories which are devoted to unclassified research, essentially in their entirety. The people come to those laboratories as visitors. Clearly, they are exposed to the activities in the laboratories. They enter into the normal environment of those laboratories. They are recognized as Chinese visitors, but it had been decided before they are allowed to come that that is an acceptable thing.

We also have laboratories such as our weapons laboratories where there are both classified and basic research activities located on the same site. Under a very careful case-by-case condition, we have allowed collaborative activities of individuals when it was considered by the Department and the laboratory to be very much in our interests for a particular scientific expert to come.

Mr. SIKORSKI. That includes Savannah River?

Mr. LEISS. No, that includes Oak Ridge National Laboratory facilities and the Los Alamos Meson physics facility at Los Alamos. It is a very controlled situation.

Mr. SIKORSKI. So the foreign visitors have come in and left at those facilities?

Mr. LEISS. Yes, sir.

Mr. SIKORSKI. No foreign visitors at Savannah River?

Mr. LEISS. I did not say that. I said no foreign visitors under this agreement.

Mr. SIKORSKI. There was a question mark at the end of that, no foreign visitors at Savannah?

Dr. LEISS. I have no way of knowing, sir. I am not involved.

Mr. SIKORSKI. Under the benefiting side pays approach that you have negotiated with the Chinese, how much have we spent and how much have they spent?

Dr. LEISS. I do not have good numbers for you because the activities under our budgets are contained as part of the activities that we support carried out by a particular research group or laboratory.

If, for example, they find it to their advantage, and they know a very good scientist who is Chinese and invite him to come and join them, they decide to use their allowed budget to hire that individual to come and join in their activities. If the Chinese send a team of people to get assistance in the design of a facility, then they pay for the specific costs involved.

Mr. SIKORSKI. Can you provide that for the record?

Dr. LEISS. I can try to make an estimate, but it will be only an estimate.

[See post-hearing questions and answers supplied on p. 107.]

Mr. SIKORSKI. Do other nations have similar types of agreements?

Dr. LEISS. There are some cooperative activities between particularly the CERN Laboratory in Europe and between the Japanese.

Mr. SIKORSKI. Now, I understand that the Department currently has negotiated new protocols on nuclear energy and fossil energy.

Can you tell us, with the full understanding that it is difficult to look into that murky crystal ball the chairman talked about, could you tell us what these protocols might very well involve and what kind of timeframe they are on?

Dr. LEISS. Sir, I have had some discussions, essentially as a message carrier of PRC interests on these agreements, particularly in the nuclear energy area, but I have not been involved at all in the discussions. So I don't feel competent to discuss them.

Obviously the nuclear energy one has been difficult to negotiate.

Mr. SIKORSKI. I would ask for the Department to contact whomever or whatever part of the agency to respond to that question.

Dr. Leiss. Yes, sir.

[See post-hearing questions and answers supplied on p. 107.]

Mr. Sikorski. Thank you.

Thank you, Mr. Chairman.

Mr. Swift. Thank you.

I recognize minority staff briefly.

Mr. Bosco. Dr. Ramundo, two quick questions.

Despite your funding limitations, given Chinese plans to electrify their short-haul rails and develop unitrain systems to bring the coal for export to their ports and to the ambitious construction of a Lanzhou to Tibet rail line through cold regions in Tibet, it appears that significant commercial opportunities do exist in the rail sector for U.S. suppliers.

Will you folks at DOT continue your efforts to try to reach an agreement of cooperation with the Ministry of Railroads?

Mr. Ramundo. We think on that one the initiative is on the Chinese side, because we made it very clear at the outset of the dialog and throughout the dialog that we are prepared to extend cooperation into the railroad area. So it is basically a Chinese initiative at this point.

Mr. Bosco. One other question.

In view of the activities detailed in the transportation protocol, in order to get things moving, can you give us just a rough estimate of a dollar figure you would need just to get the ball rolling to get a few delegations over there to look at which projects may be available for U.S. private industry?

Mr. Ramundo. Basically you are talking about very little money because we are not talking about overhead type costs such as the salaries.

All you are talking about really is travel money and per diem just to get some people there to look around and come back with some ideas as to how, in effect, we could further the interests of this subcommittee.

Mr. Bosco. Thank you, Dr. Ramundo.

Mr. Chairman.

Mr. Swift. Thank you.

Mr. Ramundo, you mentioned that the Chinese decided not to proceed with the protocol on railroads. I did not quite understand what their concern was.

When they found out that you were not going to provide any more than information, they backed away?

Mr. Ramundo. Yes; when the dialog started the Chinese had expressed an interest in negotiating two protocols. When we indicated the fiscal and personnel constraints under which we would be operating, they changed their tack and said, in effect, "Let's conclude the general transporation first," in effect covering all other areas but railroad, "and then we will come back to that." The initiative is on the Chinese side because we are waiting for them to come back and do that.

Mr. Swift. You did not get the impression that they were going to disregard altogether, that they wanted to just separate the two?

Mr. Ramundo. Only because of the institutional setup on the Chinese side where they have two ministries covering transportation, whereas in the United States, we have DOT with multimodal responsibility.

Mr. Swift. I see. All right.

So far as you know, do the Chinese have agreements with other nations on transportation technology?

Mr. Ramundo. I am not specifically aware of any, but it really is not all that important because the kinds of support that other governments give to the commercial sector, in effect, provide whatever we could do through an agreement that had potential for stimulating or promoting trade. In other words, the problem is that because our Government does not work that closely with industry, we have to make use of other mechanisms to promote trade. Other foreign governments that work very closely with industry have a sort of a built-in kind of trade promotion operation.

Mr. Swift. One last question.

Are there any impediments that you know of to the private sector participating in the transportation protocol?

Mr. Ramundo. None whatsoever. We welcome their participation.

Mr. Swift. Thank you very much, both of you. We appreciate your help to the subcommittee and your testimony.

We will be sending in writing some relatively technical questions, and we will hold the record open for your response.

Thank you very much.

The subcommittee stands adjourned until 2 p.m., Thursday, November 3, when we will take up further inquiries in the U.S.-PRC protocols.

[The following was received for the record:]

POST-HEARING QUESTIONS AND ANSWERS

Relating to

OCTOBER 31, 1983 HEARING
Before the
SPECIAL SUBCOMMITTEE ON U.S. TRADE WITH CHINA
COMMITTEE ON ENERGY AND COMMERCE
U.S. HOUSE OF REPRESENTATIVES
WITNESS: JAMES E. LEISS
ASSOCIATE DIRECTOR, OFFICE OF HIGH ENERGY AND NUCLEAR PHYSICS
OFFICE OF ENERGY RESEARCH
DEPARTMENT OF ENERGY

Question 1. As you agreed during the hearing, would you please provide an analysis of Department of Energy expenditures under the two protocols with China?

Answer:

Activities under the High Energy Physics protocol and the Nuclear Physics and Magnetic Fusion Energy Research protocol are carried out in accordance with the general principle of "benefiting side pays."

Since the Nuclear Physics and Magnetic Fusion Energy Research protocol has been signed very recently, no costs other than the relatively small expenses for travel and negotiations of the protocol have been incurred by the Department of Energy.

For the High Energy Physics protocol the expenditures from January 1979 through October 1983 by the two sides under the program of joint work are as follows:

A. For the United States the expenditures, primarily by the participating laboratories; Argonne National Laboratory, Brookhaven National Laboratory, Fermi National Accelerator Laboratory, Lawrence Berkeley Laboratory, and Stanford Linear Accelerator Center are approximately $1,300,000. This estimate includes appropriate staff salaries, travel costs, and materials and supplies.

B. Although we have not been given a dollar value for the bulk of the People's Republic of China's expenditures, they consist of the sum of salaries, housing, and travel expenses for the approximately one hundred fulltime equivalent manyears PRC has contributed in scientific personnel assigned to the U.S. for the joint program of work. Where appropriate, the PRC paid money directly to the U.S. laboratories. The total of payments to the five laboratories is $332,000.

Question 2. How does DOE coordinate with other agencies regarding patent clause language in new protocols?

Answer:

DOE does not coordinate directly with other agencies regarding patent language in any international agreement. DOE sends potential agreements to the Department of State and consults generally with them. The Department of State is responsible for coordination with all interested agencies. On an informal basis, DOE frequently discusses patent issues with other agencies, particularly NASA,as to the Chinese protocols.

Question 3. In your opinion, what could be done to strengthen the process of interagency coordination for the development of patent clause language within U.S.-China protocols?

Answer:

Some years ago the State Department held a meeting with representatives of all the agencies who dealt with the Chinese. The outcome of the meeting was that every agency wanted to pursue its own patent aims. Nonetheless, a practice of soliciting the comments of other involved agencies on proposed patent clauses could be of benefit if the agencies had staff who were cognizant of patent matters and had some commitment to pursuing a consistent approach even though it may involve difficulties in negotiation.

Question 4. As you agreed during the hearing, would you please identify who in the Department of Energy could provide information on the protocols being negotiated on nuclear energy and on fossil energy?

Answer:

The following information regarding protocols in these two areas has been provided by John A. Dugger, Acting Director, Office of International Energy Cooperation. If you need further information, he can be contacted on 252-6770.

A. Nuclear Energy Agreement

In view of possible participation of U.S. firms in the design and construction of nuclear power plants in the People's Republic of China, and in order to export nuclear material and components to China, a bilateral agreement on the peaceful uses of nuclear energy is a prerequisite. Since July 1983, two meetings were held to discuss the problems with the proposed agreement, and further meetings are required to resolve some sensitive outstanding issues. We anticipate negotiating a separate agreement which is not under the auspices of the 1979 US-PRC Agreement on Cooperation in Science and Technology. When both sides agree to a text, the final agreement will be submitted to Congress as required by the Nuclear Non-Proliferation Act of 1978.

B. Fossil Energy Agreement

The United States and the People's Republic of China have exchanged visits by experts and have identified specific fossil energy technology areas for possible cooperation of mutual benefit. These areas include coal science research, coal preparation, coal gasification and liquefaction, combustion and environmental cleanup, fuel mixtures for engines and turbines, distillation of oil shale, and other areas to be mutually agreed upon in the future. In August 1983, the Chinese asked the U.S. to prepare a draft Protocol under the 1979 US-PRC Agreement on Cooperation in Science and Technology. The draft protocol is being reviewed by the Administration and upon ratification will cover a five-year period. It is planned to send this draft Protocol to the Chinese before the end of the year.

DR. BERNARD A. RAMUNDO
CHIEF, INTERNATIONAL COOPERATION DIVISION AND SECRETARIAT
DEPARTMENT OF TRANSPORTATION

TESTIMONY BEFORE THE HOUSE SPECIAL SUBCOMMITTEE ON U.S. TRADE WITH CHINA

ADDITIONAL QUESTIONS

QUESTION: What role did the Department of State play in negotiating the Transportation Protocol?

ANSWER: The Department of State monitored the negotiation and, on request, provided facilitative assistance to advance the dialogue. It reviewed and approved the final text of the Protocol.

QUESTION: How does the Department of Transportation coordinate with the Department of Commerce and other agencies in working to implement the Transportation Protocol?

ANSWER: As with all DOT cooperative activities, whenever there appears to be a trade opportunity, we contact the Department of Commerce and, where appropriate, trade associations to advise of the activity which we believe offers commercial possibilities. At the very least, we keep the Department of Commerce and the private sector apprised of the activities and developments related to it. If appropriate, we will also arrange for Department of Commerce and/or private sector participation. Where it appears that the activities touch upon the interests of other agencies we contact them to assure that they can become involved.

QUESTION: Could you please provide a detailed review of expenditures by the Department of Transportation for protocol-related activities?

ANSWER: At this early stage in the implementation of the Protocol, DOT has not incurred any expenditures directly attributable to it. The only expenditures which could be identified as protocol-related would be the staff time of the officials of the Office of the Secretary who were involved in the negotiation of the Protocol.

QUESTION: Could you please provide specific information on the objectives, potential benefits, and probable costs associated with a DOT-sponsored mission to China under the Protocol?

ANSWER: The objectives of a possible DOT-sponsored mission to China would be to observe and evaluate the Chinese transportation system for problem areas, and explore with counterparts cooperative activities under the Protocol, including participation by the private sector. The benefits to the United States of such a mission would be a concrete demonstration of interest in implementing the Protocol and an opportunity to assess on the ground the potential for the sale of U.S. transportation technology and experience. We feel the potential in this regard is good because of the Chinese modernization effort and the important role transportation, especially railroads, inland waterways and ports, will play in this effort. The estimated costs associated with such a mission would be approximately $25,000.00.

QUESTION: Could DOT obtain support from the private sector for such an exploratory mission?

ANSWER: Chinese cutbacks and delays in its modernization program and the high front-end costs of doing business with China have dampened some of the private sector's earlier expectations and enthusiasm concerning the commercial possibilities of becoming involved in the cooperation program. Nonetheless, we feel that we can stimulate limited support from the private sector for an exploratory mission to China because of the desire to become involved in a government effort oriented toward commercial possibilities.

[Whereupon, at 12:50 p.m., the subcommittee adjourned, to reconvene at 2 p.m., Thursday, November 3, 1983.]

SCIENCE AND TECHNOLOGY: COOPERATION BETWEEN THE UNITED STATES AND CHINA

THURSDAY, NOVEMBER 3, 1983

House of Representatives,
Special Subcommittee on U.S. Trade With China,
Committee on Energy and Commerce,
Washington, D.C.

The subcommittee met, pursuant to notice, at 2 p.m., in room 2218, Rayburn House Office Building, Hon. Al Swift (chairman of the subcommittee), presiding.

Members present: Representatives Al Swift, Barbara A. Mikulski, Richard C. Shelby, Gerry Sikorski, and Thomas J. Tauke.

Staff present: Greg Mounts, professional staff; Don Bosco, minority staff.

Mr. Swift. The subcommittee will come to order.

Today's hearing is the second this week on the cooperative efforts under the 1979 Agreement on Science and Technology between the U.S. and People's Republic of China.

So far, there are more than 20 signed protocols implementing the agreement in a host of scientific and technological areas. As I stated at our first hearing, activities in areas such as energy, health, communications, transportation, and management science have important implications for the development of trade between our two countries.

Useful exchanges in these areas are essential ingredients for an economic and commercial relationship that benefits both nations.

The subcommittee is interested in reviewing the history and status of protocols to identify where important progress has been made—and where it has not. We are interested in learning about any special problems that may exist, so that we may help overcome impediments to fuller cooperation and stronger ties.

On Monday of this week, we heard an overview of the activity under the 1979 agreement from the State Department, which has day-to-day responsibility for coordinating the United States-China science and technology relationship.

We also heard testimony on the history and status of protocols involving the Departments of Commerce, Energy, and Transportation.

I would like to welcome today's witnesses. We will hear from the National Aeronautics and Space Administration about the cooperative activity in civil broadcasting and communications, access to Landsat data, and aeronautics technology.

The Nuclear Regulatory Commission will provide a review of activity on nuclear safety matters.

The Environmental Protection Agency will describe activity under its research protocol.

And the Department of Health and Human Services, Public Health Service, will provide a summary of work and expectations for cooperation in the important area of public health.

At this time, I recognize the gentleman from Iowa.

Mr. TAUKE. Thank you, Mr. Chairman.

I wish to thank Mr. Kenneth S. Pedersen, National Aeronautics and Space Administration; Mr. Joseph D. LaFleur, Jr., Nuclear Regulatory Commission; Dr. Thomas E. Malone, Department of Health and Human Services; and Mr. Fitzhugh Green, Environmental Protection Agency, for appearing before the special subcommittee this afternoon.

The program of scientific and technological cooperation between the United States and China is a significant aspect of our expanding relationship with China, and along with the direct scientific and technological benefits of such cooperation and the furtherance of foreign policy objectives, significant trade opportunities for U.S. firms may be generated.

Clearly, the U.S. agencies involved in these cooperative efforts can do much to assist the U.S. private sector by providing information as to China's foreign procurement needs.

Active and direct contact between engineers, scientists and technical personnel in China and the specialized technical agencies of the U.S. Government will maximize the benefits of this effort and is encouraged.

I feel that there are great opportunities for the United States and China to expand our commercial ties, and I look forward to your testimony.

Thank you.

Mr. SWIFT. The gentleman from Alabama.

Mr. SHELBY. Mr. Chairman, I just want to say that I want to commend you as the chairman of the special committee for pursuing your objectives here between China and U.S. trade.

I look forward to participating in the hearing.

Mr. SWIFT. I thank the gentlemen.

All of the members of the subcommittee who are present today visited China last spring as part of the Energy and Commerce Committee delegation. That is what sparked our considerable concern in this area.

I am glad that my colleagues have been able to join me today.

Mr. Pederson, I understand you have some prepared remarks. All of your prepared remarks will be made a part of the record without objection. You may proceed as you wish; but first, for the record, please identify yourselves.

Mr. LAFLEUR. I am Joseph D. Lafleur, Jr., NRC.

Mr. PEDERSON. I am Ken Pederson from NASA. I have with me Mr. Peter Smith from NASA.

Mr. SWIFT. Mr. Pederson, you are recognized.

STATEMENT OF MR. KENNETH S. PEDERSON, DIRECTOR OF INTERNATIONAL AFFAIRS, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, ACCOMPANIED BY MR. PETER SMITH, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Mr. PEDERSON. Thank you, Mr. Chairman.

I have an abbreviated oral statement. I will submit the longer statement for the record with the subcommittee's permission.

Mr. SWIFT. Without objection.

Mr. PEDERSON. Mr. Chairman and members of the subcommittee, it is a pleasure for me to appear before this distinguished subcommittee to testify on NASA's activities under the 1979 Agreement on Scientific and Technological Cooperation with the People's Republic of China.

NASA's activities under this agreement are based on two subordinate documents: The Understanding on Cooperation in Space Technology of January 31, 1979, and the Protocol on Cooperation in Aeronautical Science and Technology, signed May 11, 1983.

In the fall of 1978, a Chinese space delegation, headed by the president of the Chinese Academy of Space Technology (CAST), Dr. Ren Xinmin, was invited by NASA to come to the United States to discuss Chinese interests in space technology and visit NASA and aerospace industry facilities.

The visit took place from late November 1978 through January 1979, and resulted in agreement on the Understanding on Cooperation in Space Technology. The main provisions of the understanding were:

One, China undertook to purchase, "under suitable conditions," a U.S. satellite broadcasting and communications system, including associated ground receiving and distribution equipment. The space portion of the system was to be launched by NASA. Depending on the extent of the ground segment, the cost of the system was estimated at $150 to $500 million.

Two, China also declared its intent to purchase, again "under suitable conditions," a U.S. ground station capable of receiving Earth resources information from instruments aboard the NASA Landsat remote-sensing satellites, including Landsat-D. Such a ground station was estimated at $7 to $12 million.

Following the signing of the overall agreement, NASA and CAST continued to correspond, further refining the Chinese proposals and the U.S. response.

During May and June 1979, a U.S. space delegation visited Chinese space facilities, including the Chinese satellite launch facility near Jiuquan in Gansu Province. In the course of the visit, further discussions were held on both the broadcasting and communications satellite system, and on the Landsat ground station.

In preparation for the visit of the U.S. space delegation to China, interagency efforts were undertaken to develop technology transfer guidelines for the proposed Chinese procurement of the two systems.

Guidelines for the broadcasting and communications satellite system were developed and agreed to before the delegation's visit; because of the relatively more sophisticated equipment involved in the Landsat ground station, guidelines for its sale continued under study through the next year, and were not finally completed until April 1980.

It was NASA's practice at the time to permit foreign ground stations to receive Landsat data by direct downlink from the satellites on the basis of memoranda of understanding between NASA and the Foreign Government Agency.

On this basis, NASA undertook during 1979 to negotiate an MOU with the Chinese Academy of Sciences. The MOU was signed on January 24, 1980, in Beijing, during the first meeting of the United States-China Joint Commission on Scientific and Technological Cooperation.

With NOAA's assumption of operational responsibility for the Landsat system, a replacement NOAA-Chinese MOU is currently under negotiation.

By mid-1980 reports of China's economic difficulties and plans for economic retrenchment began to reach the West.

Finally, in a letter dated December 30, 1980, CAST President Ren Xinmin informed NASA Administrator Frosch that due to Chinese economic difficulties, procurement of the broadcasting and communications system was being deferred indefinitely.

On February 4, 1981, in delivering a letter from Dr. Frosch acknowledging that decision, the U.S. Embassy in Beijing noted that if and when the Chinese decided to resume the procurement, the United States believed that the commitments of the two sides in the understanding should remain in effect.

Negotiations between the Chinese Academy of Sciences and U. S. Landsat ground station suppliers continued inconclusively until late 1982.

At that time the Academy entered contract negotiations with Systems & Applied Sciences Corp. [SASC], with which the Chinese Academy of Sciences signed a procurement contract in January 1983.

SASC filed for export licenses in March, and interagency consideration of these applications continued through the recent China visit of Commerce Secretary Baldridge.

As a result of general understandings reached with the Chinese during that trip, and subsequent adjustments in U.S. export controls applied to China, the SASC applications are now proceeding through the final stages of interagency review.

During a meeting with NASA Administrator Beggs in June 1983, and subsequently in conversations with the U.S. aerospace firms, Chinese Vice Minister of Astronautics Cheng Lianchang revealed that China had decided to revive its plans for a broadcasting satellite system.

It appears that the system which the Chinese are now seeking is substantially identical with the broadcasting portion of the original hybrid satellite discussed in the 1970 understanding.

In a letter to NASA in July, the Ministry of Astronautics provided some further detail on this revived Chinese interest, and reiterated Vice Minister Cheng's statements during his visit that, in addition to the procurement of satellites and associated equipment, China would seek extensive access to satellite design and manufacturing technology. The Chinese proposal is currently under interagency review.

For its part, NASA considers its role to be a contribution of its technical expertise to the interagency review process and, where appropriate, facilitating contacts between the Chinese and U.S. industry.

We, of course, also have a programmatic interest in providing launch services for future Chinese satellites as foreseen in the 1979 understanding.

During the January 1980 Joint Commission meeting in Beijing, senior officials of the Chinese Academy of Space Technology approached NASA Administrator Frosch with proposals for cooperation in aeronautics.

As in the case of space cooperation, we immediately sought interagency guidance on the technology transfer implications of the Chinese proposals.

The response which we received indicated that carefully structured cooperation would be possible. On this basis, visits of aeronautics delegations were exchanged during 1980, and negotiations were begun on a Protocol on Cooperation in Aeronautical Science and Technology.

Draft language and proposals for cooperation were exchanged over the next 2 years, and differences were narrowed finally to language governing intellectual property—specifically language specifying rights to patents in third countries arising out of the cooperative activity, and language concerning the handling of proprietary information, such as trade secrets, which might be introduced into the cooperative relationship by either party.

Given the potential economic significance of aeronautical technologies, we felt, and continue to feel, that special care and attention to these issues are justified.

These issues remain unresolved and the aeronautics protocol which was signed in Beijing on May 11 of this year contains the explicit provision that cooperative activities would not commence until an annex covering the remaining points on intellectual property is concluded.

We have made new proposals to the Chinese aeronautical establishment on these open questions, and are awaiting its response.

I believe that NASA's experience in scientific and technological cooperation with China makes a couple of points which may be particularly relevant to this subcommittee's interests.

First, NASA sought, from the first, to generate trade benefits from its activities; indeed, the focus of the 1979 understanding was almost exclusively on purchases from U.S. industry.

Second, by its nature NASA operates near the technological cutting edge, and the content of its understanding with China inevitably raised legitimate technology transfer concerns.

Under the new overall United States-China technology transfer guidelines which are now being put in place, a decision regarding the Landsat ground station sale now seems relatively near.

I think that our experience also confirms another important point.

Products of aerospace technology tend to have large price tags, however good the long-term economic justification for the investment. In a time of particular economic stringency, it should not be surprising that the Chinese chose to defer the broadcasting and communications satellite procurement, and perhaps to slow the pace of the Landsat ground station procurement.

This was an experience shared with many suppliers to China in recent years, in fields far from space technology. We naturally intend to continue our efforts with China on behalf of United States industry, and in fulfillment of United States foreign policy goals.

Thank you, Mr. Chairman.

[The statement of Mr. Pederson is as follows:]

Statement of

Mr. Kenneth S. Pedersen
Director of International Affairs

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

before the

Special Subcommittee on U.S. Trade with China
Committee on Energy and Commerce
House of Representatives

Mr. Chairman and Members of the Subcommittee:

It is a pleasure for me to appear before this distinguished Subcommittee to testify on NASA's activities under the 1979 Agreement on Scientific and Technological Cooperation with the People's Republic of China.

Background

NASA's activities under this Agreement are based on two subordinate documents: the Understanding on Cooperation in Space Technology of January 31, 1979 and the Protocol on Cooperation in Aeronautical Science and Technology, signed May 11, 1983.

The Understanding on Cooperation in Space Technology grew out of a visit to China in July, 1978 by a delegation headed by the then Science Advisor to the President, Dr. Frank Press. NASA's Administrator at that time, Dr. Robert Frosch, accompanied Dr. Press. During the visit, discussions were held between Dr. Frosch and Chinese space officials, which resulted in the identification of two Chinese areas of interest -- acquisition of a broadcasting and communications satellite system, including space and ground segments, and acquisition of a Landsat ground station.

Broadcasting and Communications Satellite System

Early Chinese interest focused on a satellite system to perform two separate tasks: point-to point communications, including television program distribution; and direct television broadcasting. The former function was to be handled by a conventional C-band communications package, communicating with Chinese-built ground terminals, some of which were already in existence. The latter, representing near state-of-the-art technology, was to involve medium-power transmission of Ku-band television broadcasts direct to small ground terminals. While the Chinese plans on this point never became definitive, they reportedly planned eventually to have one such ground station in each of China's over 2600 counties, coupled to a low-power television transmitter to redistribute the television signal to conventional receivers. Depending on the extent and cost of the ground segment, and the degree to which it could be provided by the Chinese themselves, the cost of the system the Chinese desired was then estimated to be in the range $150-500 million.

Landsat Ground Station

During the 1978 visit, interest had also been expressed by the Chinese in buying from U.S. industry a ground station capable of receiving data from the instruments on NASA Landsat satellites, including Landsat-D, then under development. At that time, the Landsat system already included ground stations in a number of foreign countries, but none in Communist countries. After interagency review, NASA informed the Chinese of its willingness to enter into discussions.

The Understanding on Cooperation in Space Technology

A Chinese Space Delegation, headed by the President of the Chinese Academy of Space Technology (CAST), Dr. Ren Xinmin, was invited by NASA to come to the U.S. to discuss Chinese interests in space technology and visit NASA and aerospace industry facilities. The visit took place from late November 1978 through January 1979, and resulted in agreement on the Understanding on Cooperation in Space Technology. The main provisions of the Understanding were:

o China undertook to purchase, "under suitable conditions," a U.S. satellite broadcasting and communications system, including associated ground receiving and distribution equipment. The space portion of the system was to be launched by NASA.

o China also declared its intent to purchase, again "under suitable conditions," a U.S. ground station capable of receiving earth resources information from instruments aboard the NASA Landsat remote sensing satellites, including Landsat-D.

o It was also agreed that through further discussions and correspondence, the two sides would develop the details of the Understanding and consider other fields of civil space cooperation which could be of mutual interest and benefit.

Following the signing of the overall Agreement, NASA and CAST continued to correspond, further refining the Chinese proposals and the U.S. response. During May and June 1979, a U.S. Space Delegation visited Chinese space facilities, including the Chinese satellite launch facility near Jiuquan in Gansu Province. In the course of the visit, further discussions were held on both the broadcasting and communications satellite system, and on the Landsat ground station.

In preparation for the visit of the U.S. Space Delegation to China, interagency efforts were undertaken to develop technology transfer guidelines for the proposed Chinese procurement of the two systems. Guidelines for the broadcasting and communications satellite system were developed and agreed to before the delegation's visit; because of the relatively more sophisticated equipment involved in the Landsat ground station, guidelines for its sale continued under study through the next year, and were not finally completed until April, 1980.

It was NASA's practice at the time to permit foreign ground stations to receive Landsat data by direct downlink from the satellites on the basis of Memoranda of Understanding between NASA and the foreign government agency. On this basis, NASA undertook during 1979 to negotiate an MOU with the Chinese Academy of Sciences. The MOU was signed on January 24, 1980 in Beijing, during the first meeting of the U.S. - China Joint Commission on Scientific and Technological Cooperation. With NOAA's assumption of operational responsibility for the Landsat system, a replacement NOAA-Chinese MOU is currently under negotiation.

Meanwhile, Chinese negotiations with U.S. industry continued. A Chinese Landsat Users Delegation visited the United States in the summer of 1979, explored applications of Landsat data and visited potential ground station suppliers. Correspondence further refined Chinese requirements for the broadcasting and communications satellite system. During the January, 1980 Joint Commission meeting, the Chinese provided further information on their requirements and asked NASA to arrange a series of visits to China by a "short list" of potential suppliers and systems consultants. Those visits took place in the late spring of 1980.

By mid-1980, reports of China's economic difficulties and plans for economic retrenchment began to reach the west. Finally, in a letter dated December 30, 1980, CAST President Ren Xinmin informed NASA Administrator Frosch that due to Chinese economic difficulties procurement of the broadcasting and communications system was being deferred indefinitely. On February 4, 1981, in delivering a letter from Dr. Frosch acknowledging that decision, the U.S. Embassy in Beijing noted that if and when the Chinese decided to resume the procurement, the United States believed that the commitments of the two sides in the Understanding should remain in effect.

Negotiations between the Chinese Academy of Sciences and U.S. Landsat ground station suppliers continued inconclusively through 1980 and most of 1981, on the basis of the technology transfer guidelines which had been made available to qualified U.S. vendors in April, 1980. Late in 1981, a new U.S. vendor approached the Chinese, and, without benefit of access to the guidelines, signed a contract with the Chinese Academy of Sciences in March, 1982. That contract was never confirmed by the Chinese Government, however, because the U.S. firm encountered legal difficulties and closed its doors in mid-1982.

Further complicating the situation, during this period the Chinese Academy of Sciences notified NASA that technical conditions at the planned Landsat ground station site necessitated a "split-station" configuration, with the receiving site remote from the data processing portion. In the summer of 1982, an interagency group convened under the auspices of the Office of Science and Technology Policy produced a new set of unclassified technology transfer guidelines, incorporating the "split station" concept. These guidelines were published in the Federal Register on October 8, 1982.

Meanwhile, the Chinese had resumed their negotiations with potential ground station suppliers, and by late 1982 had entered contract negotiations with Systems and Applied Sciences Corp.(SASC), with which the Chinese Academy of Sciences signed a procurement contract in January 1983. SASC filed for export licenses in March, and interagency consideration of these applications continued through the recent China visit of Commerce Secretary Baldrige. As a result of general understandings reached with the Chinese during that trip, and subsequent adjustments in U.S. export controls applied to China, the SASC applications are now proceeding through the final stages of interagency review.

Broadcasting satellite plans revived

In June 1983, at the invitation of NASA, a Chinese delegation headed by the Vice Minister of Astronautics, Cheng Lianchang, came to the United States for the launch of STS-7. In addition to visiting NASA facilities and meeting with NASA Administrator James Beggs, the delegation also met with several U.S. firms which had earlier been interested in the proposed procurement of the broadcasting and communications satellite system under the 1979 Understanding.

During a meeting with NASA Administrator Beggs, and subsequently in conversations with the U.S. aerospace firms, Vice Minister Cheng revealed that China had decided to revive its plans for a broadcasting satellite system. It appears that the system which the Chinese are now seeking is substantially identical with the broadcasting portion of the original hybrid satellite discussed in the 1979 Understanding. The Chinese apparently have decided, for the time being at least, to meet their point-to-point telecommunications needs through leased Intelsat capacity and through their first domestically produced communications satellite, which is scheduled for launch later this year or in 1984.

In a letter to NASA in July, the Ministry of Astronautics provided some further detail on this revived Chinese interest,

and reiterated Vice Minister Cheng's statements during his visit that, in addition to the procurement of satellites and associated equipment, China would seek extensive access to satellite design and manufacturing technology. The Chinese proposal is currently under interagency review.
For its part, NASA considers its role to be contribution of its technical expertise to the interagency review process and, where appropriate, facilitating contacts between the Chinese and U.S. industry. We also have a programmatic interest in providing launch services for future Chinese satellites as foreseen in the 1979 Understanding.

Aeronautics Cooperation

During the January 1980 Joint Commission meeting in Beijing, senior officials of the Chinese Academy of Space Technology approached NASA Administrator Frosch with proposals for cooperation in aeronautics. As in the case of space cooperation, we immediately sought interagency guidance on the technology transfer implications of the Chinese proposals. The response which we received indicated that carefully structured cooperation would be possible. On this basis, visits of aeronautics delegations were exchanged during 1980, and negotiations were begun on a Protocol on Cooperation in Aeronautical Science and Technology. Draft language and proposals for cooperation were exchanged over the next two years, and differences were narrowed finally to language governing intellectual property -- specifically language specifying rights to patents in third countries arising out of the cooperative activity, and language concerning the handling of proprietary information, such as trade secrets, which might be introduced into the cooperative relationship by either party. Given the potential economic significance of aeronautical technologies, we felt, and continue to feel, that special care and attention to these issues are justified.

These issues remain unresolved and the Aeronautics Protocol which was signed in Beijing on May 11 of this year contains the explicit provision that cooperative activities will not commence until an Annex covering the remaining points on intellectual property is concluded. We have made new proposals to the Chinese Aeronautical Establishment on these open questions, and are awaiting its response.

Conclusions

I believe that NASA's experience in scientific and technological cooperation with China makes a couple of points which may be particularly relevant to this Subcommittee's interests. First, NASA sought, from the first, to generate trade benefits from its activities; indeed, the focus of the 1979 Understanding was almost exclusively on purchases from U.S. industry. Second, by its nature NASA operates near the technological cutting edge, and the content of its

Understanding with China inevitably raised legitimate technology transfer concerns. Under the new overall U.S.-China technology transfer guidelines which are now being put in place, a decision regarding the Landsat ground station sale now seems relatively near.

I think that our experience also confirms another important point. Products of aerospace technology tend to have large price tags, however good the long-term economic justification for the investment. In a time of particular economic stringency, it should not be surprising that the Chinese chose to defer the broadcasting and communications satellite procurement, and perhaps to slow the pace of the Landsat ground station procurement. This was an experience shared with many suppliers to China in recent years, in fields far from space technology. We intend to continue our efforts with China on behalf of U.S. industry, and in fulfillment of U.S. foreign policy goals.

Mr. SWIFT. Thank you very much. Mr. Pederson.

We will take testimony from both witnesses and then ask questions.

STATEMENT OF DR. JOSEPH D. LAFLEUR, JR., ASSISTANT DIRECTOR FOR INTERNATIONAL COOPERATION, U.S. NUCLEAR REGULATORY COMMISSION

Mr. LAFLEUR. Mr. Chairman and members of the committee, I am Joseph D. Lafleur, Deputy Director of the Office of International Programs of the Nuclear Regulatory Commission, and the U.S. administrator of the Protocol on Cooperation in Nuclear Safety Matters between the Nuclear Regulatory Commission (NRC) and China's State Scientific and Technological Commission (SSTC).

To better explain the protocol that you have invited me here to discuss, I would like to describe briefly NRC's overall responsibilities and our program of bilateral information exchange arrangements, and then outline how the protocol fits into our international cooperation activities.

In the interest of keeping my testimony brief, Mr. Chairman, I request permission to supply for the record my letter to you of October 21 that enclosed a detailed report on NRC's cooperation with the People's Republic of China under the terms of the protocol.

Mr. SWIFT. That will be made part of the record.

Mr. LAFLEUR. Under the reorganization of U.S. nuclear energy activities in 1975, the U.S. Nuclear Regulatory Commission (USNRC) was given responsibilities for nuclear energy regulation. NRC has been pleased to cooperate with other countries concerned with nuclear safety and regulation matters to improve the safety of their nuclear power programs and our own as well.

One means by which this is achieved is through bilateral information exchange arrangements. These arrangements, which are agreements to exchange technical information and to provide for training of individuals from foreign nations in nuclear safety areas, form the foundation of our program for international nuclear safety cooperation.

In the case of the People's Republic of China, the arrangement takes the form of a protocol under the United States-China Technology Cooperation Agreement.

Limited at first to those countries which had made a major commitment to light water reactor technology, this cooperation was soon expanded to include countries with developing nuclear power programs or with firm plans to enter the field, particularly those countries importing U.S. reactors and other equipment.

NRC currently has formal arrangements with the nuclear regulatory authorities of Belgium, Brazil, Denmark, Egypt, Finland, France, the Federal Republic of Germany, Greece, Israel, Italy, Japan, Korea, Mexico, the Netherlands, the Philippines, Spain, Sweden, Switzerland, the United Kingdom, and the People's Republic of China.

We also exchange nuclear safety information with the Taiwan nuclear energy program through the American Institute in Taiwan.

We have cooperative safety research agreements with various agencies and institutes of many of these same countries on a bilateral or multilateral basis, cooperative programs including exchange of information and actual cooperation on large research projects. We save tens of millions of dollars a year by virtue of the contributions of the foreign governments.

Advice by NRC to our arrangement partners typically includes the timely notification of NRC licensing actions on reactor types similar to those exported. We are talking here about the technology affecting the safety of reactors in their country.

We also give advice on our analyses of problems similar to those encountered abroad; transmittal of written NRC standards, criteria and other documentation pertinent to health, safety, and environmental concerns; and notification of construction and operating events, including abnormal occurrences, with details on how the problems are being investigated and corrected in this country.

NRC also arranges for representatives of foreign regulatory organizations to be assigned to the NRC technical staff for periods of 4 months to 2 years, to gain on-the-job experience, and for these assignees and others to attend NRC training courses on a wide range of subjects such as regulatory procedures, analysis techniques, and nuclear powerplant design and operation.

Foreign observers have also accompanied NRC inspectors on U.S. nuclear facility inspections and have participated in the various emergency exercises in this country.

In addition, about 500 foreign nuclear officials visit NRC each year, mostly to participate in detailed technical discussions of safety analysis work that has been done by the NRC staff, while a number of senior foreign regulatory officials visit our Commissioners each year.

We receive in exchange large amounts of information about activities in their country and we send some of our engineers overseas to follow up on information that we have gained in some of these exchanges.

As the foreign programs get more and more sophisticated, we are beginning to get a lot of useful information from each program. In fact, some of the problems today that are bothering the nuclear industry in various places have occurred first in foreign countries.

We have, through these exchanges, recieved full information on development of the problems and the solutions that are being developed to use in our programs as a result of our cooperation.

Turning now to the NRC Protocol with the PRC, on the basis of reciprocity and mutual benefit the NRC and the Chinese SSTC agreed in October 1981, following several years of discussions, to conduct exchanges and collaborative activities in the field of nuclear safety very similar to those described above for other countries with which we cooperate.

We have had several visits back and forth to discuss and exchange information. We are accepting assignments of PRC nuclear engineers to work within NRC's safety program; and a substantial number of U.S. safety documents, as well as a few reactor safety computer codes, have been supplied to the Chinese.

Because the PRC power reactor program is in an early stage of development, they are not yet in a position to supply information of major importance to the U.S. safety program. However, they have committed to provide NRC with a variety of nuclear plant safety guides, standards and safety analyses, and have supplied information on the selection and training of their research reactor operators, journals on radiation protection, and some design standards.

We have received from them information on qualifications and testing of their operators of research reactors. Over time we expect a greater balance and reciprocity to develop in the exchange as their program grows in size, and the close contact which this exchange encourages should enhance the Chinese safety program at this critical early stage and provide a solid basis for good communications between us on key issues in the future.

Mr. Chairman, I believe the NRC-SSTC cooperation lays the basis for better relations between our two countries in insuring the health and safety of the public for this important area of advanced energy technology.

For information on how cooperation with China on nuclear safety matters may relate to a possible trade relationship with China, I would respectfully refer you to the executive branch, which has the responsibility for these matters.

Thank you, Mr. Chairman. This concludes my prepared testimony.

[The attachments accompanying the statement of Mr. Lafleur are as follows:]

The Honorable Al Swift
November 21, 1983
Attachment

USNRC - PRC SSTC S&T COOPERATIVE PROGRAM

The following describes the program of cooperation between the USNRC and PRC State Scientific and Technological Commission (SSTC) under its signed Protocol.

Title

"Protocol Between the Nuclear Regulatory Commission of the United States of America and the State Scientific and Technological Commission of the People's Republic of China on Cooperation in Nuclear Safety Matters"

Agencies

USNRC-SSTC

Ministry of Nuclear Industry
Bureau of Science and Technology and Nuclear Power
Institute of Atomic Energy (IAE)

Signed

Signed in Washington, DC, October 17, 1981, during final plenary session of the Second Meeting of the U.S.-PRC Joint Commission on Scientific and Technological Cooperation.

Administrators

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PRC - Mr. XU Wanjin
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Department of Coordination for Specially Promoted Projects of the SSTC
State Scientific and Technological Commission
Beijing, People's Republic of China

Goals

Provide for the timely exchange of nuclear safety information and cooperation in related activities, including safety research, accident analysis, and regulations between the U.S. and China.

Objectives

- Provide for an exchange of information:
  regulatory rules and safety guides, technical reports, news releases, correspondence and visits
- Provide for training and temporary assignments of personnel
- Provide for possible cooperation in nuclear safety research (activities to be limited to those useful in the development of a nuclear safety regulatory program)

Background Information on Negotiation of Protocol

The Chinese Nuclear Society (CNS) first raised the question of how to set up an exchange of technology, information, and personnel in the reactor safety area during a visit to NRC shortly after U.S. normalization of relations with China. NRC indicated at that time that it would discuss this further as China developed its plans and organization for a nuclear power program. When the CNS renewed their request in 1980, NRC developed and forwarded for their consideration an Arrangement proposal narrower in scope than those it has concluded with countries actively engaged in nuclear power production, but which still allowed for the exchange of important reference documents and the provision of technical assistance, if appropriate. The Chinese then identified the State Scientific and Technological Commission as the group responsible for nuclear affairs in China and moved to resolve outstanding issues (most of them minor) so that the "Protocol" could be signed during the Second Meeting of the U.S.-PRC Joint Commission on Scientific and Technological Cooperation in October 1981.

Achievements

The following exchange of technical information has taken place under the terms of the Protocol:

- eight bilateral visits to exchange information (Attachment 1)
- three USNRC computer codes sent to the IAE (Attachment 2)
- three technical assignments of PRC nuclear engineers to work with the NRC safety program (Attachment 3)
- NRC Documents - Regulatory Guides and NUREGs (approximately 1,300 documents requested by the Chinese)

Problems/Comments

The PRC power reactor program is in an early stage of development and at this time the PRC is not able to exchange any information of substantial significance to the U.S. program. However, the PRC Ministry of Nuclear Industry has agreed to provide NRC with as many applicable reports as possible (Attachment 2).

Although NRC recognizes that the present exchange of reactor safety information under the signed NRC-SSTC Protocol is not balanced, the exchange is important because it contributes to the worldwide safe use of nuclear power reactors.

Furthermore,

1. The supply of the basic set of NRC safety documents should help the PRC get a clear understanding of nuclear safety as it is practiced in the U.S. at this early, critical stage of nuclear power development in the PRC; and
2. The closer contact which this exchange will encourage between the PRC program and ours will contribute to better relations between our countries and hence to better communication in the future on key nuclear safety and nonproliferation issues.

Future Projects

- Continue the exchange of technical reports and computer codes.
- Continue to develop technical assignments for PRC nuclear engineers to work with the NRC staff on safety issues.

Attachment 1

CHRONOLOGY OF VISITS UNDER THE TERMS OF THE PROTOCOL

December 2-10, 1981	Dr. Long Sun Tong, Chief Scientist, Office of Nuclear Regulatory Research, NRC, visited PRC to get familiar with full scope of PRC nuclear safety activities and resources to provide NRC with background for proposed PRC visit to U.S.
January 4-21, 1982	Energy Delegation from PRC, headed by then PRC Protocol Administrator WEI Zhaolin, met with NRC Commission and staff to discuss implementation of Protocol. January 4 discussions followed by site visit to Government and industry facilities.
January 16-20, 1982	James R. Shea, Director, Office of International Programs, NRC visited PRC for discussions of the status of their nuclear power program, their nuclear safety organization, and implementation of the NRC-SSTC Protocol.
March 2-6, 1982	Denwood F. Ross, Deputy Director, Office of Nuclear Regulatory Research, NRC, visited PRC to present a series of lectures on the licensing and regulatory aspects of nuclear power plants and the potential application to the PRC program.
May 16-23, 1982	Harold L. Sullivan, Chief Experimental Programs Branch, Division of Accident Evaluation, Office of Nuclear Regulatory Research, NRC, visited PRC to present series of lectures on NRC reactor safety computer codes.
July 30-August 4, 1982	NRC Commissioner Victor Gilinsky, accompanied by Joseph D. Lafleur, Jr., visited PRC to meet with nuclear officials to discuss light water reactor safety issues and program of cooperation under the NRC-SSTC Protocol.
May 8-19, 1983	Lawrence C. Shao, Deputy Director, Division of Engineering Technology, Office of Nuclear Regulatory Research, NRC, lectured in Beijing on seismic design criteria for nuclear power plants, structural and mechanical designs and on U.S. operating experience related to reactor vessels, steam generators and piping.
July 15, 1983	Energy Delegation from PRC, headed by then PRC Protocol Administrator JIA Wei Wen, met with the Commission and NRC Protocol Administrator Joseph D. Lafleur, Jr. to discuss cooperation activities under the Protocol.

Attachment 2

EXCHANGE OF NRC COMPUTER CODES

The following are NRC reactor safety computer codes identified by the NRC and SSTC (IAE) to be needed in the PRC program at this time. All are publicly available, not subject to any export restrictions, and were reviewed by DOE for any Part 810 or other sensitivity:

1. RELAP5 MOD 1 - Thermal hydraulic code used to calculate an operational transient and loss-of-coolant accident (LOCA) in a pressurized water reactor. (Sent to the PRC July 19, 1982)
2. FRAP-T6 - Transient fuel pin analysis code. (Sent to the PRC December 29, 1982)
3. CONTEMPT-LT Version 28 - Predicts the pressure and temperature response of BWR and PWR containments as a result of a LOCA transient. (Provided to PRC Embassy, Washington April 22, 1983)

EXCHANGE OF DOCUMENTS

NRC has agreed to supply about 1,300 documents on reactor safety (listed in NUREG-0304) in exchange for the following information on the Chinese program:

1. Nuclear power plant safety guides and standards.
2. Other industrial guides and standards applicable to the construction and fabrication of nuclear power plants.
3. Chinese standards and experience on nuclear energy radiation exposure.
4. The safety analysis of the 300 MWe PWR being designed at the 728 Institute.

This month we completed delivery of the NRC reports.

From the Chinese we have thus far received information on their research reactor operator selection and training program, journals on their radiation protection experiences, and design standards for industrial pressure vessels.

Attachment 3

PRC ASSIGNEES TO NRC

1. XUE, Dazhi; Institute of Nuclear Energy Technology; work on NRC contract with Brookhaven National Laboratory in areas of probability and risk assessment; September 1983-September 1984.
2. LIN, Chengge; Institute of Atomic Energy; work with the NRC staff in the accident evaluation branch which develops models for and performs calculation and evaluation of potential accidents and event scenarios. (Proposed 6-month assignment November 1983-April 1984).
3. YU, Erjun; Qing Hua University; work with NRC staff in the reactor systems branch which has review responsibility for reactor thermal-hydraulic systems, coolant systems, emergency core coolant systems and associated auxiliary systems. (Proposed 6-month assignment November 1983-April 1984).

Mr. SWIFT. Thank you, Dr. Lafleur.

Let me talk a little bit about the satellite communication system. Mr. Pederson, you indicated that technology transfer guidelines were worked out in mid-1979.

Are those guidelines still applicable?

Mr. PEDERSON. Those guidelines were worked out, Mr. Chairman, in the context of the original request of the Chinese which was for a particular type of satellite which was to be delivered in orbit.

The Chinese have come and indicated to us in their discussions recently that they now have in mind a somewhat different satellite, that is only the direct broadcast portion.

They have also indicated two other things to us:

No. 1, that they foresee or are interested in substantially more technology transfer or transfer of know-how and direct experience than they had contemplated earlier.

Second, they have indicated to us that they are discussing the possibility of this hardware being supplied by other countries and, indeed, appearances are that the French and the German industries, perhaps others, have, indeed, been contacted.

Given these developments in the interim, my guess would be that those guidelines, which did not foresee, I think, a degree of technology transfer that the Chinese now indicate they are interested in, may not be applicable.

Mr. SWIFT. So, you may have to renegotiate then?

Mr. PEDERSON. Yes, indeed, in response to the Chinese request to enter into discussions with them with respect to this new interest they have, we have, indeed, convened an interagency group to look at that request not only in light of the new Chinese interest, Mr. Chairman, with respect to the amount of technology they would like to see, but also in light of the new developments that have occurred in the overall relationship to China in the export control area.

I should have added early on that those were, of course, drafted in a period before these recent modifications were made by the administration.

Mr. SWIFT. You answered my next question.

Clearly, when everything there is finalized on the new approach that the administration has proposed, maybe that will make your life a little easier.

Mr. PEDERSEN. I welcome anything that makes my life easier, Mr. Chairman.

Mr. SWIFT. Let us talk about the direct broadcast satellite a bit. First of all, I presume that the Chinese are interested in that as a way of getting television programing out to the far reaches of their country.

Is that their primary concern? Is it information and entertainment and that kind of thing that they are looking to DBS for?

Mr. PEDERSON. It is certainly information. How much of it is entertainment, I don't know.

Mr. SWIFT. I saw some programing. I know what you mean.

Mr. PEDERSON. Their definition of entertainment may be slightly different from ours, but it is dissemination of information.

What they foresee, as we understand it, is something slightly different than we think of when we see DBS here when we visualize a small roof-top antenna on each home.

They foresee a powerful satellite which broadcasts to 1.8 to 3 meter dishes in various localities, perhaps in each county, which would then be transmitted from these dishes by more conventional means to homes and villages, and so on.

Mr. SWIFT. They would really be using it as a means of getting the signal out into the hinterland and then would distribute it from that point?

Mr. PEDERSON. That is our understanding.

Mr. SWIFT. One would think that there would be an opportunity there for the U.S. private sector to provide some of that equipment.

Mr. PEDERSON. Obviously, the opportunity is there and the Chinese have indicated to us that they are interested in discussing with U.S. industry not only the satellites, but some of the ground systems.

We do not know, at least they have not informed us, how much. They have indicated in the past in their discussions with us they feel they have some indigenous capability in this area which may suggest in some of the areas they may feel they can do some of that. But certainly an opportunity.

Mr. SWIFT. We have discussed in the hearing earlier this week the value of feasibility studies which help define a problem and design the solution. The provider of such a service has some advantage then when it comes to implementing.

Do you think there is an opportunity for a feasibility study, that type activity in this regard? I would appreciate a comment on that.

Mr. PEDERSON. I would answer that in two ways:

As I mentioned in my testimony, the satellite they are talking about now appears to be very similar to a portion of the satellite they talked about earlier. They have certainly dropped the point-to-point communication aspect of it and kept the DBS portion to the extent it appears to be similar to part of the satellite they talked about with us earlier.

Much of that feasibility study had been done as part of the 1979 effort. Indeed, they engaged Comsat to serve as consultant to them and others to look into much of this.

I don't want to be presumptuous and indicate I can say that the Chinese are wholly satisfied, but I do know that a great deal of the work that we would normally think of as feasibility study has probably been done.

Mr. SWIFT. I wondered if that was the case.

Do U.S. firms, so far as the information you have, have the capability of providing the ground station equipment that the Chinese might need at a competitive cost?

Mr. PEDERSON. Yes. My hesitation only related to the question of competitive cost. Certainly the answer is yes, they have the capability. Certainly they have the ability to compete competitively at world market prices.

What you encounter oftentimes in these areas where countries and industry are looking to break into a big new market, you are not always quite sure what other countries or industries in other countries might be able to, or might be willing to price their product at in order to break into what one might see to be a very large and lucrative market.

Competitive with market prices, no question about it. How competitive it might be in light of what other countries might be willing to do in terms of subsidizing their industry or providing very favorable funding and financing terms, I don't know. We have no indication that there will be difficulty.

Mr. SWIFT. Who would be our major competitors? You mentioned Germany and France. The Japanese, I would presume?

Mr. PEDERSON. The Japanese perhaps. France and Germany would probably be, either together or separately, might well be the most immediate competitors.

They have been developing experience in this area. They are developing some very advanced communications satellites in Europe with their industry now.

We know that the Chinese even in 1979 have had discussions with several of the major firms in France like Aerospaciale in France or MBB in Germany.

The Japanese certainly have some capability here, as do perhaps even the Canadians, perhaps in a teaming arrangement with some other country. I am not sure whether the Canadians would have the capability to do the whole job, but they would have capability to do part of it.

Mr. SWIFT. In specialized areas?

Mr. PEDERSON. Yes. I think it is fair to say the Chinese would have options.

Mr. SWIFT. One last question before I yield to my colleagues.

When we were there we saw the first ground station, I think it was installed by us for President Nixon's visit. That is still in use.

Would the DBS satellite that China would own be capable of carrying broadcasts from this country and other countries or would it be strictly one that they would use or could use for internal communication?

Mr. PEDERSEN. I think their intent was primarily to use it for internal communications. I know of no reason why it necessarily would have to be limited to that.

Mr. SMITH. Just regulatory reasons. International ground rules.

Mr. PEDERSEN. There is nothing technologically limiting.

Mr. Swift. Thank you.

I recognize the gentleman from Iowa.

Mr. Tauke. Thank you, Mr. Chairman.

Mr. Lafleur, how well do you work under the protocol on nuclear cooperation?

Mr. LaFleur. The Agreement on Nuclear Cooperation is one required under the Atomic Energy Act. Those agreements usually acknowledge and encourage the exchange of information, including safety and other technology.

So, there would be no conflict with NRC. The existing cooperation on safety which, as you know, is under the Scientific Cooperation Agreement would tend to supplement and support this cooperative activity.

If we do not come to an agreement on cooperation, then it would mean that the Chinese are going toward different technology than we have and would tend to dampen interest in our cooperation as it exists now.

The people that sell the light-water technology, the Western World, now the French, Germans, and Japanese, do sell something very close to what we have. So, there would still be a strong interest in safety exchange between the two countries.

Mr. Tauke. Under your current arrangements you have with other countries, formal arrangements, is the NRC reimbursed for its cost in providing information or obtaining techniques and if so, is there an administrative surcharge included in that cost?

Mr. Lafleur. The principle that we apply in general is that the benefiting side pays. So, the people who come here to work in our program are paid for by their employing agency at home.

They come here in our program to work and most of the people who come here end up, I believe, supplying more good man-hours of work than any costs we incur.

Mr. Tauke. Therefore, there is no cost?

Mr. Lafleur. Essentially there is no cost. When we want to go there for our reasons to learn about what they are doing and talk to them or to get information from them, we pay for the trips.

When they want to come here, they pay.

There is one exception I mentioned in the remarks and in the letter I sent that we have furnished them some reports. We have a policy of distributing important NRC documents under our exchanges to the countries that ask for them.

The plan there is in principle that we will get back the same from them. We have received from the Chinese, as I mentioned, less by a good measure than we have sent so far.

This is not expensive. It is of the order so far of a few thousand dollars. They have sent back something probably less than a thousand dollars in cost.

Mr. Tauke. Is this policy that you generally have with other countries?

Mr. Lafleur. We apply the same.

Mr. Tauke. Have you discussed with the Chinese their plans to construct nuclear power stations near Shanghai and Tenhai and have any discussions indicated the Chinese are interested in pursuing U.S. equipment?

Mr. **Lafleur**. I have visited there twice. Several other people from NRC have visited there and reported the interest of the Chinese in building these plants at the two locations.

There have also been several reports about an interest by individual Chinese in working with the United States. Many of them speak English as the first foreign language.

We have reported this through channels to the executive branch agencies.

Mr. **Tauke**. The Commerce Department will be getting that information and that theoretically would go to the private sector?

Mr. **Lafleur**. Reports go to the State Department to be distributed by them to all the agencies including Commerce.

Mr. **Tauke**. Mr. Pedersen, you were talking about some fairly expensive items with Mr. Swift.

Do you know how the Chinese plan to finance the purchase of any of these rather large items?

Mr. **Pedersen**. We don't know specifically. There have been indications——

Mr. **Tauke**. Perhaps I should follow up and say have they talked about the Eimbank?

Mr. **Pedersen**. Yes. In some of our discussions with them and based upon the discussions we understand they have held with potential U.S. suppliers, they have indicated they may want to use either Eximbank or a mix of World Bank, Eximbank and perhaps other sorts of funding.

We have no specifics, to my knowledge, beyond that. In some cases it is a bit early because they haven't really had to finalize those arrangements, but we do have indications they have certainly considered the Eximbank and World Bank or a mix of them.

Mr. **Tauke**. Is financing a problem?

Mr. **Pederson**. It can be. It probably is more so now than it might have appeared early on in 1979 when there was this great rush of enthusiasm on both sides and perhaps they slightly overestimated what they could swallow as did we make some overestimation.

I think it could be important. As I indicated in my testimony, in 1979 they agreed they would purchase land satellites and communications satellite systems from U.S. industry. They asked specifically to have included in that agreement the phrase "under suitable conditions."

We had always assumed that among those suitable conditions that they had to take into consideration was a competitive price and a competitive financing package.

I think I have to say it certainly would be a factor. Whether it would be determinative or not, I don't know.

Mr. **Tauke**. Mr. Lafleur, could the same be said about purchases in the nuclear power area?

Mr. **Lafleur**. Our discussions with them have been strictly on safety and regulatory matters.

Mr. **Tauke**. Thank you very much, gentlemen.

Thank you, Mr. Chairman.

Mr. **Swift**. The gentleman from Alabama.

Mr. **Shelby**. Thank you, Mr. Chairman.

When several of us were visiting China back in the spring we had several discussions about the purchase of nuclear powerplants. I think they were talking about three or four. The gentleman from Iowa got into that a little bit. I recognized several weeks ago and I don't recall where it was that this was going forward.

Do you have a current status report on that? Do you have any information to that effect of any licensing applied for?

Mr. LAFLEUR. I know the media reported that the construction is about to begin or has begun on the two large plants which would furnish Hong Kong electricity.

Mr. SHELBY. That is site construction?

Mr. LAFLEUR. I think it is site construction.

The same, I think, is happening to sites, clearing and preparation, in the case of a smaller prototype that the Chinese themselves will build near Shanghai. That is called the 728 Institute site.

Mr. SHELBY. Of course, we were told in the meeting with various Chinese officials in Shanghai and also Beijing straight up that they, of course, were interested in American technology. They mentioned Westinghouse stuff, but not solely Westinghouse.

I for one thought, well, we ought to try to do business with them. They are going to buy it somewhere. They are going to buy it from Japan or the French or the British maybe. Why don't we do it?

Mr. LAFLEUR. Several of our firms have a strong interest in participating in these projects. I believe substantially all of the big business involved is pending outcome of the discussions on our Agreement for Cooperation.

Mr. SHELBY. Do you have any basic money figures about what the three nuclear power sites of the sizes they are talking about might possibly run as far as export, and so forth, if it were to come about?

Mr. LAFLEUR. A rough figure would be in terms of export from the supplying country. For the three, about $1 billion dollars.

Mr. SHELBY. Also a lot of American jobs there.

Mr. LAFLEUR. Involved in producing the equipment here, yes.

Mr. SHELBY. Have you been aware of the announcement—was it a media announcement or official announcement about the recent conclusion of an agreement, I believe it was General Electric, to manufacture and sell a number of diesel locomotives to the Chinese?

Mr. LAFLEUR. No.

Mr. SHELBY. Anybody?

Mr. PEDERSON. No, I am sorry.

Mr. SHELBY. Thank you, Mr. Chairman.

Mr. SWIFT. Thank you.

I have some additional questions I would like to go into.

Talking about Landsat for a moment, could you describe some of the applications that Landsat data might have for the Chinese economy and if you feel these applications would help facilitate the United States-China trade?

Mr. PEDERSON. The applications that Landsat data might have for China are in many cases the same types of applications that they might have in many countries that are engaged in an effort to dramatically accelerate the development.

In particular, Landsat data can be used for purposes of monitoring crops and agriculture. It can be used for manning and planning of a variety of infrastructure development, roads, railways, pipelines, and so forth, in terms of selecting the most preferred routes.

Measuring deforestation, measuring and monitoring things like flood damage and water, silt buildup in harbors and at the mouths of rivers, and so on. It has certain geological applications, potential use in identifying mineral deposits or areas of potential mineral deposits.

Mr. SWIFT. You have named a number of things there which we know are of particular importance to the Chinese as they try to reach their goals by the end of the century. Transportation routes, pipelines, minerals.

Mr. PEDERSON. With respect to the second half of your question, Mr. Chairman, with regard to the trade possibilities, over and beyond the possibilities related to the selling or the sale of the hardware itself, the Landsat ground station, there is a fairly rapidly developing field of what one might call value added activities in which companies, particularly a number of U.S. firms, do this in which they take the raw Landsat data and by the application of certain processing formula, computers, and so forth, they use the data and enhance it and bring out certain features and make it particularly attractive for one use rather than another, or interpret the data to provide interpreting service with respect to what the data shows or means.

I would not want to imply this is a huge industry, but it is a growing industry. It is another area where U.S. firms have a very significant capability and a leg up by virtue of the Landsat system being the first and only civilian system flying and making this data available.

So, it is another area where we could benefit U.S. industry.

Mr. SWIFT. You say that the transfer of Landsat receiving technology is still being reviewed by the administration.

What is the status of that?

Mr. PEDERSON. That is in the very final stages of the export licensing process. The Chinese have entered into an agreement, as I mentioned in my statement, with SASC to provide this station.

SASC has made their proposal to the Government as per existing regulations for getting an export license to send that hardware and related technology to China. That review process is very near its completion.

It focused in the Department of Commerce and State Department. NASA is really a technical adviser to that process. My understanding from talking to them is that it is very near completion and that the decision on that should be forthcoming shortly.

Mr. SWIFT. What is the nature of the security issue surrounding Landsat?

Mr. PEDERSON. There are serveral issues. I do not know whether I would call them security. Certainly they border on that.

The Landsat data, itself, is not of the kind of resolution that represents a security problem in that regard. What is of concern or has been of concern is that in the station, itself, particularly with the newest Landsat which has a quite high data rate sensor on it, certain tape recorders of very high speed, highly capable tape recorders are utilized.

So, one of the concerns has been to try to find an arrangement by which they would have the tape recorders capability they need to get Landsat, but that could not be utilized for other purposes other than Landsat.

It is of the kind of nature, the extent to which the hardware might have other uses beyond the Landsat program.

Mr. SWIFT. Can Landsat equipment be used to monitor other satellites?

Mr. PEDERSON. You mean the antenna to track other satellites?

Mr. SWIFT. Yes.

Mr. PEDERSON. It is antenna oriented. It can move and as such it can be used to receive information from certain other satellites transmitting in that same band that it is designed to receive.

It cannot be used to intercept and monitor communication activities of a much more sophisticated sort.

Mr. SWIFT. Has NASA worked with the Chinese in development of their own communication satellites?

Mr. PEDERSON. No, not directly. When they approached us initially, very shortly after normalization, at their initial request, we had discussions with them to better understand what their needs were so that we could help translate these effectively into not only guidelines, but also help them have a better understanding of what U.S. industries might be most responsive or most experienced in areas that they were interested in.

We have tried to be of that sort of help. We have worked with them in helping them have a better understanding of what U.S. industry can provide, but we have not provided a consulting service per se to the Chinese.

As I have mentioned earlier, there are a number of firms in the U.S. private sector who have a great deal of experience doing this in a variety of cultural and international settings. It has been our policy at NASA to try to encourage countries to make use of this U.S. private sector expertise where it exists.

Mr. SWIFT. What about propulsion systems for satellite launchers? Have they asked for or have we given them anything?

Mr. PEDERSON. Yes, they have indicated an interest in it. We have not provided any expertise in that regard.

While we were in China, the original NASA group I referred to in my testimony in May of 1979 to discuss further with them the Landsat satellite system and the communication satellites and to get a firsthand look at their capabilities and facilities, part of this was reciprocity for their visits to our facilities, the principle of reciprocity is important here, too.

They indicated to us several other areas where they would like to have some type of ongoing relationship, cooperation, sharing of information and the like.

One of those areas did involve certain propulsion technologies. So, they have expressed an interest. They have, as you know, their own launch vehicle program. They have launched a number of their own satellites. So, they have a demonstrated capability in this area.

NASA, as a matter of practice, does not provide, does not normally cooperate in the propulsion area.

Second, our feeling was that we ought to make some very positive steps in communications in the Landsat area before we take on too broad a menu with them.

Mr. Swift. Let me examine one other brief area and then if you will be so kind, we may submit to you some additional questions in writing and we will hold the record open for replies.

I would like to talk briefly about the patent protection aspect of this. We discussed it with some of the other agencies as well.

Why has that language been so difficult to nail down from your perspective?

Mr. Pederson. I think there are several reasons. In part it appears to be a philosophical difference.

NASA has quite a bit of experience in working with foreign nationals in our centers. We have had international cooperative programs, extensive international cooperative programs, for over 20 years.

We have quite a record and experience with this. Our traditional approach has been to feel that when a foreign national comes and works at our center or in the sense of being there on some sort of fellowship or in some sort of visiting program or whatever, that what he or she develops as a result of working with NASA's technology base and training, and so forth, that NASA, the U.S. Government with NASA as its agent, ought to have the right to patent that in their countries.

Now, we are talking only about third countries. There is no dispute we would have patent rights in the U.S. and they would have patent rights in China. It is the question of who would have the first opportunity.

Obviously, if we passed on it, they would have a right to do that.

So, this is the way we have always essentially approached this problem and we have indicated to the Chinese that that is the nondiscriminatory way that we have dealt with all other countries in similar arrangements and we feel that is a fair and equitable approach for them.

They have indicated some difficulty with that and have tended to appear to favor a process by which the patent right would adhere to the individual, but I think in this case to China with respect to third countries.

Our difficulty here has made it a little more hard for me to answer this question because while we have gone back several times to them and explained our approach and the rationale behind it and then invited them to please give us the rationale and justification or reason why they couldn't accept our proposal or why they felt there was a better approach, we have, quite frankly, been unsuccessful in getting any information from them other than that they don't like our approach.

We have recently asked again would they please provide us with the rationale for why they can't utilize this approach. It is a little hard for me to explain where they are coming from in this particular regard because they have not helped us a great deal.

Obviously, it is an area we are somewhat concerned about. As I mentioned earlier, we are talking aeronautics and the value of that technology in terms of trade is extremely high. It is a foundation stone of the U.S. economy.

Patent rights and licensing rights in third countries can have tremendous value to them. So, it is not a small item in our mind. We are trying strenuously to understand better the Chinese difficulty.

Mr. SWIFT. Thank you very much.

We will be submitting some additional questions.

I am going to yield to my colleague from Alabama and also turn the gavel over to him to complete this panel and begin the next. I will return as quickly as I can.

Thank you very much.

Mr. SHELBY [presiding]. I have a couple of questions.

If and when the United States and China reach an agreement on nuclear cooperation, would the safety-related design features now being implemented in China allow for the introduction and integration of U.S. reactor technology?

Mr. LAFLEUR. We have very little information so far on what they are demanding in terms of safety of their reactors. We certainly have no indication that they would be more stringent and our technology would not fit.

Mr. SHELBY. Do you have any judgment on how joint research on safety technology on nuclear powerplants might be conducted between the United States and China?

Mr. LAFLEUR. The way we do it with other countries is to define safety research objectives, for example, to get the data needed to decide about the standards to impose to meet the danger of a nuclear problem we have encountered. Then we go to other countries and we find other people who are interested in these problems and other people who have money to contribute toward our program or laboratory facilities and programs of their own to supplement ours.

The Chinese do have several laboratories that could do some work of this kind to contribute significantly to our programs.

One of the ways probably could be that they might learn to start to use some of our calculation codes or some that they would develop independently to calculate safety of their reactors.

The reports from them on that will be useful to us in checking out our codes and insure that they can be applied successfully to various design variations in reactors.

Mr. SHELBY. Do they have computer capability there to design these codes?

Mr. LAFLEUR. So far the computers they have are what the West allowed them to import over the last 20 or 30 years. They are not the big, fast working computers that are needed to calculate most of the reactor safety development.

They are trying to modify some of their existing computers to do them in a slower way. We are working with them in some cases.

Mr. SHELBY. Gentlemen, I appreciate your coming. I appreciate your patience.

As the chairman announced, you will probably be getting additional questions.

We look forward to having you again before us.

Thank you.

Mr. PEDERSON. Thank you.

[The information follows:]

WRITTEN RESPONSES TO QUESTIONS SUBMITTED BY THE HOUSE SPECIAL SUBCOMMITTEE ON U.S. TRADE WITH CHINA AT WHICH MR. PEDERSEN TESTIFIED

Question 1. What type of activities do you anticipate under the new aeronautics protocol?

Answer. We believe it is prudent to begin with a modest initial phase of cooperation, affording us the opportunity to select further activities with the best chance of success. This initial phase of activities is to involve symposia in structural analysis methods and combustion fundamentals, emphasizing fundamental, theoretical and experimental aspects. The workshops would provide us an opportunity to exchange technical papers, discuss technical topics, and explore the prospects for further activities of mutual interest in the two fields.

Question 2. What role could the private sector play under the aeronautics protocol?

Answer. While we have not identified any specific opportunities for the private sector in our discussions with the Chinese to date, we will be alert to such openings in the future. For example, Chinese interest in acquiring equipment for aeronautical research facilities could present an excellent prospect of sales for U.S. firms.

Question 3. Does NASA coordinate the development of patent rights language with other agencies that face the same issue under a U.S.-China protocol?

Answer. Yes. We have worked particularly closely with the Department of Energy, whose negotiations with the Chinese are at a similar stage.

Question 4. What role does the State Department play in coordinating patent language? What role could it play?

Answer. Our positions have been coordinated through the State Department at every stage. We have consulted with the State Department's Legal Advisor as well.

Question 5. What new proposals have been made by NASA for cooperation in other areas? What proposals have been made to NASA by the Chinese? Is there a working group to reach agreement on new proposals?

Answer. At the May Joint Commission meeting in Beijing, we and the Chinese exchanged new lists of proposals for future cooperation in space science and technology. From these, each side selected three topics proposed by the other, for inclusion in a short list for futher definition. We hope to convene a joint working group early next year to develop a program of cooperation from this short list, and will be writing to the Chinese shortly to propose such a meeting.

Question 6. Could you please describe the NASA budget process in terms of obtaining funding for cooperative activity under the protocol? In addition, could you please provide a detailed review of NASA expenditures under the protocols?

Answer. NASA's international cooperative programs, including those with China, are funded as an integral part of its overall research and development program. No funds are earmarked exclusively for international research and development programs, which means that programs involving international cooperation must be justified on their technical merits in competition with all others. There is a small amount—less than $50,000 annually—budgeted for direct costs of carrying out cooperative activities with China and other countries. These funds are used for subsistence, interpreters, use of facilities and other expenses arising from cooperative activities. Typically, in NASA's experience with Chinese counterparts, their "shopping" trips for equipment or technology have been entirely at their expense, while reciprocal exchange activities have been conducted on the basis that the "receiving side" is responsible for the visitors' in-country expenses.

Direct expenses incurred by NASA for activities under the Science and Technology Agreement have been very limited. The major items in the past few years are:

	Thousands
Chinese Space Delegation 1978–79	$30
U.S. Space Delegation 1979 (international travel only)	10
NASA Aeronautics Delegation 1980 (international travel only)	16
Chinese Aeronautics Delegation 1980	22
NASA Astronauts to China 1982 (international travel only)	10
Chinese Astronautics Ministry Delegation 1983	18

Question 7. What specific agreements have been reached with the Chinese regarding launch services provided by NASA?

Answer. The 1979 Understanding on Cooperation in Space Technology provided that NASA would launch any satellite system acquired by the Chinese from U.S. industry, on a reimbursable basis. We have recently reiterated this commitment in respect to the new direct broadcast system the Chinese are expressing interest in currently. We would also not exclude the possibility of launching Chinese payloads or experiments on the Space Shuttle as part of a cooperative project, but not such opportunity has yet been identified.

DR. JOSPEH LAFLEUR, NUCLEAR REGULATORY COMMISSION, RESPONSES TO QUESTIONS SUBMITTED BY THE SUBCOMMITTEE

Question. Could you describe the status of China's nuclear energy program? For example, how many reactors exist, are under construction, or are planned? What type of technology, from which countries, is being used?

Answer. The Chinese have no operating nuclear power reactors at this time. They have announced plans to construct two 900-MW light water reactors in the Province of Guangdong (near Hong Kong). Authorities are now discussing with several foreign companies the construction costs, loan terms, technology transfer, and participation in the project.

The 728 Reactor Design and Research Institute is designing and starting to build a prototype 300-MW LWR. The plant will be sited on the north bank of the Hangzhou Bay.

Question. Could you describe the reactor safety program in China? Could you characterize it in terms of the Safety programs of other nations? The U.S. safety program?

Answer. China's nuclear power program is in an early stage of development and does not have an NRC-type organization or safety program. Through the Protocol China has with the NRC, they have received many NRC regulatory safety guides that are being considered for their nuclear program.

Question. Please describe the role of computers in reactor safety programs. What is the significance of computer codes?

Answer. Computers permit safety analysis using simulated models (codes) of operating conditions. Thus, very complex safety analyses can be performed with a manageable amount of effort.

Question. So far, you have provided three computer codes to the Chinese program. How will such computer codes be used in the Chinese program? Are these codes compatible with Chinese computers? Or will the codes be models for the Chinese? How many codes does the NRC expect to provide under the protocol?

Answer. The Chinese have informed us that they have successfully installed the three NRC safety computer codes on their CYBER-12 computer. They are currently running the codes to check their results with numerical results provided in sample problems and preparing input data for using these same codes for safety analysis of their 300-MW reactor design. The exact number of codes to be given to the Chinese is not yet determined, although six additional technical analytical areas have been identified for which NRC codes are available. Before any code is sent, it is reviewed by the Executive Branch for compliance with 10 CFR Part 810, for non-proliferation sensitivity, and for all other policy considerations.

Question. Are the Chinese developing a regulatory framework for safety in their nuclear energy program? If so, what role has the NRC played?

Answer. I have been told that within China's nuclear organization, consideration is being given to developing a regulatory framework for the nuclear safety program. The basic set of NRC safety documents which we have supplied, the several lecturers sent to China, and the training we are supplying should help China get a clear understanding of nuclear safety as it is practiced in the U.S., and of many of the technical problems being faced.

Question. Based on the Chinese documents you have received regarding design standards for industrial pressure vessels, how would you characterize Chinese technical achievements in these areas?

Answer. We are unable to characterize Chinese technical achievement in this area on the basis of documents NRC has received.

Question. Does the NRC cooperate with the Chinese on resolving issues in the PRC program like: Whether to base the accident standard in the design on the melting of the core, as in the U.S., or on the melting of the fuel rod shells? how to calculate earthquake probabilities? and, how to calcuate the "maximum flood level" above which all stations must be located?

Answer. NRC's cooperation with China's developing nuclear program has not involved jointly resolving technical issues.

Question. You said that there is no indication that safety features in the Chinese program will be more stringent than in the U.S. There are, however, press reports that the Chinese will use a "three train" or triply safeguarded cooling system, which is a higher level of safety than customarily used in the U.S. Is this correct? Has the NRC been involved in helping the Chinese analyze alternatives in cases like this?

Answer. I am not familiar with the press report you have cited that describe the cooling system being designed by the Chinese for their reactor. NRC has not been involved in helping the Chinese analyze alternative reactor designs.

Question. Could you elaborate on your comment that failure to reach an agreement on nuclear cooperation between the U.S. and China would result in reduced activity under the nuclear safety protocol?

Answer. What I mean is that if China builds a rector that is not similar to ours, then their safety problems will be different from ours, and their official and commercial ties will be with other countries. Under this condition, the benefits of our cooperation will be less important to both sides, and there would be less incentive for each side to cooperate than if U.S. technology and equipment were involved.

Question. Does the protocol include cooperation on the safety matters concerning waste disposal?

Answer. Yes. The Protocol does include cooperation on safety matters concerning waste disposal.

Mr. SHELBY. Our next panel will be Mr. Fitzhugh Green, Associate Administrator for International Activities, U.S. Environmental Protection Agency; and Dr. Thomas Malone, Deputy Director, National Institutes of Health, Public Service, U.S. Department of Health and Human Services.

Mr. Green will be accompanied by Dr. Gary Waxmonsky, U.S. Coordinator, United States-People's Republic of China Environmental Protection Protocol.

Gentlemen, your written statements will be made a part of the record without objection. If you would just briefly summarize orally your remarks, it will give us a chance to ask you some quesitons and maybe come up with additional comments.

Mr. GREEN. Thank you, Mr. Chairman.

Mr. SHELBY. If you will identify yourself.

Mr. GREEN. I am Fitzhugh Green, U.S. Environmental Protection Agency.

Mr. WAXMONSKY. Gary Maxmonsky, U.S. Coordinator, United States-People's Republic of China Environmental Protection Protocol.

Mr. MALONE. I am Thomas E. Malone, Deputy Director of the National Institutes of Health.

Mr. SHELBY. Go ahead.

STATEMENT OF MR. FITZHUGH GREEN, ASSOCIATE ADMINISTRATOR FOR INTERNATIONAL ACTIVITIES, U.S. ENVIRONMENTAL PROTECTION AGENCY ACCOMPANIED BY: DR. GARY WAXMONSKY, U.S. COORDINATOR, UNITED STATES-PEOPLE'S REPUBLIC OF CHINA ENVIRONMENTAL PROTECTION PROTOCOL

Mr. GREEN. Mr. Chairman, we are happy to testify before you on the subject of the United States-China agreement in terms of the EPA involvement in it.

Dr. Waxmonsky, who is with me, has been singlehandedly directing this program for EPA for the last couple of years.

We described our program to you in some detail in a letter that Mr. Ruckleshaus sent to the chairman this June. I will just touch base on how it came about and a few details of the program.

As you know, the first United States-People's Republic of China Environmental Protection Protocol was signed in February 1980.

The full text of the environmental protection protocol has been submitted for the record.

Basically it boils down to three annexes. They are set forth on the basis that three principles will be adhered to, equality, reciprocity, and mutual benefit.

We feel that these principles show the protocol was designed to promote cooperative activities and benefit to both sides. That is, that both sides ought to benefit, although not necessarily in identical degress and identical ways.

The three annexes we are working with them on are annex 1, environmental health; annex 2, environmental pollution control, and annex 3, environmental processes and effects.

Until 1980 we communicated, EPA and the Chinese, only at high-level policy talks. After that a team of scientists and managers from our Office of Research and Development visited China to get acquainted at the working level. Because of each side's primary concern for public health, we settled on annex 1 as the first component to get a project started on.

The Chinese water quality analyst visited EPA's research lab in Cincinnati for 10 weeks in April 1981, one of our scientists returned the visit a year later. Meanwhile, we translated, studied and revised a Chinese proposal for joint research on health effects of organic combustion products.

For reasons beyond us, the Chinese have never shown further interest in annex 2, environmental pollution control. It is too bad. For the purpose of this meeting, that is the one we feel is the most likely area for increasing trade, although we don't think it is at a high level.

We have seen the pace of the cooperation pick up considerably in the past year. In September of 1982 three of our specialists visited Beijing. They made plans for a 5-year study on possible relationship between organic combustion products like smoke from the indoor burning of coal and respiratory diseases, particularly lung cancer.

We had a considerably detailed requirement of getting them on a loan basis equipment and supplies for this study.

I know you are aware of delays, but all of these materials have been shipped including one item which was subject to Department of Commerce export license. It took about three months to get that through with a lot of cooperation, in spite of rules and regulations, by the people involved at Commerce and State.

Three EPA specialists are in China right now on a 1-month trip. They are at a place called Xuanwei. This is the research site where they are going to work on the explanation to our Chinese colleagues on how to work this equipment and collecting data.

We have invited the Chinese to send specialists to the United States next year to work with our scientists in processing and analyzing the data that they are generating. We think this is a good solid project and it is well underway.

Early next month we are expecting a team of eight Chinese scientists to come here, to discuss specific research activities under annex 3, environmental processes and health effects.

Then we are going to send a couple of specialists to China for joint work monitoring air pollution, transport and transformation.

On the basis of data acquired in China, we hope to evaluate and refine mathematical models we use to understand the physical and chemical properties and processes of environmental pollution.

We feel that the Chinese in turn will derive valuable information from us in terms of their planning and control of specific localities.

I am looking forward to meeting my opposite number on the protocol, Mr. Qu Geping when he gets here next month. I think that Chairman Dingell met him in Beijing in April.

We feel that maybe this meeting coming on the heels of the joint research in the field in China on coal combustion and health effects will dispel any real concern on his part that the EPA is not sincere or able to cooperate effectively.

The Administrator will certainly get behind this effort. When Mr. Qu Geping comes and his team comes, of course we will be happy to arrange any meetings with any of your committee members who might want to make themselves available.

Mr. Chairman, we realize that the Chinese did complain during the visit of Chairman Dingell and members of the committee in April in terms of progress under the protocol. We tried to address these concerns that they expressed in detail in our letter that Mr. Ruckelshaus wrote on June 22.

I was not personally involved in the problems beforehand. I recently returned to EPA, but apparently from the beginning there has been a problem of our stressing to them that we didn't see that the protocol would be a vehicle for the transfer of funds and equipment.

They see it the other way and the argument goes on. We are going to try to work this out when Qu Geping gets here next month. Although the argument continued it has not stopped us from working with them. We hope to resolve it soon.

I should mention that there are a lot of people involved in this agreement at EPA, both in my office and in the research and development office and the laboratories.

There are several agency people, I think five or six, who are ethnic Chinese, either born in China or raised with that background. They are enormously helpful to us.

In terms of the protocol's potential for enhancing our ability to expand trade with the Chinese, I am not sure how far we can go. We will do everything we can within our own constraints, as a regulatory agency.

We have talked to Chris Phillips of the National China Trade Council. Dr. Waxmonsky has been in touch with a couple of their committees and we have responded to a number information requests from individual firms.

We certainly will facilitate, when requested, contact between them visiting Chinese and American business interests. We want to be helpful. But we need to obey the law in terms of being a regulatory agency.

That is the substance of what we want to say to you.

[The statement of Mr. Green is as follows:]

STATEMENT OF FITZHUGH GREEN, ASSOCIATE ADMINISTRATOR, OFFICE OF INTERNATIONAL ACTIVITIES, ENVIRONMENTAL PROTECTION AGENCY

Mr. Chairman, I value this opportunity to report to the Special Subcommittee on our bilateral program with the People's Republic of China. At EPA we consider this, of course, as one of our top bilateral environmental ventures. Our Administrator, Mr. William D. Ruckelshaus, has frequently stated his concern that EPA's international efforts help to speed mankind's ability to protect the quality and safety of our physical environment. With me today is Dr. Gary Waxmonsky who has been serving very ably for almost two years as the U.S. Coordinator of EPA's agreement with China.

* * * * *

As you know, Administrator Ruckelshaus described our program with the PRC in a letter to Chairman Dingell this past June. Our program has progressed well since then, and I am happy to tell you the latest developments.

Let me first review our EPA's cooperative relationship with China. The US-PRC Environmental Protection Protocol was signed in February 1980. It was the thirteenth in a series of US-Chinese protocols in the field of science and technology cooperation; more than 20 such protocols are now in effect. The full text of the Environmental Protection Protocol has been submitted for the record. Its substance is contained in three annexes agreed to in May 1980. Both the Protocol itself and the agreement on the three annexes state three principles: equality, reciprocity, and mutual benefit. These principles show that the Protocol was designed to promote cooperative activities of interest and benefit to both sides. That is, both sides must benefit, although not necessarily to identical degrees or in identical ways.

The May 1980 agreement also outlined cooperative research in three fields: environmental health (annex 1), environmental pollution control (annex 2) and environmental processes and effects (annex 3). The two sides also agreed in principle to add annexes on environmental impact assessment and preservation of nature. (Since then, the Department of the Interior has talked to the Chinese about a separate protocol on nature conservation.)

Until October 1980, EPA and the Chinese communicated only in high-level policy talks. Then a team of scientists and managers from our Office of Research and Development visited China to get acquainted at the working level. Because of each side's primary concern for public health, Annex 1 became the first component of the Protocol to realize actual collaboration; a Chinese water quality analyst visited EPA's research laboratory in Cincinnati for ten weeks in early 1981. One of our scientists returned the visit a year later.

Meanwhile, we translated, studied and revised a Chinese proposal for joint research on the health effects of organic combustion products; I will come back to this later. We also discussed with the Chinese how to implement Annex 3, Environmental Processes and Effects Research.

For reasons beyond us, the Chinese have never shown further interest in Annex 2, Environmental Pollution Control. At the same time this is the least developed of the three signed annexes. More on this point when I discuss the Protocol's potential for stimulating commercial contacts in pollution control technology.

* * * *

The pace of cooperation has picked up considerably in the past year. In September 1982, three EPA specialists visited Beijing. They finalized plans for a five-year study on the possible relationship between organic combustion products like smoke from indoor burning of coal, and respiratory diseases - primarily lung cancer. Mr. Ruckelshaus' June 22 letter to Chairman Dingell explained the administrative details of loaning equipment and supplies to the Chinese for this important study. I am happy to report, Mr. Chairman, that all these materials have been shipped to Beijing, including one item which was subject to Department of Commerce export license. (In this case, the entire licensing process, including COCOM review, required about three months, and we are grateful for the assistance provided by the Department of Commerce and State in expediting this action.)

Three EPA specialists are now in China for approximately one month, working at the research site to assist our Chinese colleagues in setting up the equipment and collecting data. We have invited the Chinese to send specialists to the U.S. next year to work with our scientists in processing and analyzing these data. This solid research effort is now well underway in China.

We are also planning for a visit by eight Chinese scientists and officials due early next month to discuss specific joint research activities under Annex 3, Environmental Processes and Effects.

We expect that this will be followed by a visit of two US specialists to China for joint work in modeling air pollution transport and transformation. On the basis of data acquired in China, EPA hopes to validate and refine the mathematical models we use to understand the physical and chemical properties and processes of environmental pollution.

The Chinese, in turn, will derive valuable information on planning and managing pollution control in specific localities. This sort of mutual benefit makes for effective bilateral cooperation. We will do everything possible to make it successful.

When the Chinese delegation comes next month I look forward to greeting my opposite number under the Protocol, Mr. Qu Geping. I believe you, Mr. Chairman, met him in Beijing last April. I trust that such a meeting, coming on the heels of the joint field research in China on coal combustion health effects, will dispel any geniune concern on Mr. Qu's part as to EPA's sincerity and ability to cooperate effectively. I know that the Administrator will want to reinforce this point directly to Mr. Qu, assuming their schedules are compatible. We would also be happy to include in Mr. Qu's program a meeting with any of the Members of the Energy and Commerce Committee who may be available while the Chinese delegation is in Washington.

* * * *

Mr. Chairman, we recognize that the Chinese expressed to Committee members during your visit to China in April some dissatisfaction with progress under the Protocol. Since their specific concerns were addressed by Administrator Ruckelshaus in his June 22 letter to Chairman Dingell, I will not burden you with a detailed response here. However, I would like to make one general comment regarding the background to the Protocol. From the very beginning of our negotiations on the Protocol, we made clear to the Chinese that we did not envision the Protocol as a vehicle for the transfer of funds or equipment to China--indeed, that we would be unable to do so. Rather, we envisioned cooperative research and other activities which would be truly bilateral and provide benefit to both sides. Nevertheless, the Chinese side understandably has hoped to obtain maximum benefit from the Protocol in terms of financing and transfer of equipment. They have used a variety of means to try to get us to accept their view of the relationship, and we have continued--rightly, I think--to disagree with them. It is important to assess the progress of our cooperation in the context of these differing views.

Let me add, Mr. Chairman, that I cannot help but be impressed by the time and energy which our EPA staff - those in my office, managers in ORD's headquarters staff, bench scientists and administrative officers in the laboratories - have contributed to make this program work. It takes genuine dedication on the part of talented professionals working in close concert to produce results in this program. I can assure you, Mr. Chairman, that our people have these qualities, and will do their best to produce worthwhile results.

* * * *

Finally, just what is the potential of the Protocol for enhancing commercial opportunities in the field of pollution control and environmental engineering? This has been a goal strongly supported by the Administration from the very beginning. I have raised this aspect of our program with Ambassador Chris Phillips of the National Council for US-China

Trade. Dr. Waxmonsky has addressed two of the Council's trade committees, and we have responded to numerous information requests from individual firms. I don't know how useful these contacts have been so far. But as the frequency of contact with our Chinese colleagues increases, we should know more about their needs and interests in pollution abatement controls. We will ask our specialists to be alert to such information, which could be passed to the Department of Commerce or made directly available to a trade association such as the National Council.

Second, we will be happy to facilitate, through any organization such as the National Council, contact between visiting Chinese delegations and U.S. private sector representatives. (In fact, we are in the process of doing this for the PRC delegation expected in December.) By the same token, we would welcome appropriate private sector participation in EPA-sponsored delegation visits to China.

Third, I will raise with my Chinese counterpart in December the question of Annex 2, Environmental Pollution Control, and attempt to assess the level of Chinese interest in activating this annex. If his response is at all positive, we would have at least a framework for further communication on technical aspects of pollution control; such dialogue might well serve eventually to foster business contacts in this field. It would then remain to develop specific guidelines for private sector involvement, bearing in mind the Agency's obvious role in the regulatory process as impartial custodian of the public interst.

Mr. SHELBY. We appreciate your testimony.

It seems to me, and I was on the trip with Chairman Dingell and Congressman Swift and others, there are so many impediments that we have had to overcome. Not all of it is our fault. I think we are going down the road to some understanding and I hope that your agency will cooperate in that area.

You have a new Administrator, and so forth. I like to think something will come out of it.

Mr. GREEN. He is determined that we do what we can to support the environmental protection movement around the world.

Of course, as part of this administration, we are not adverse to being close to the private sector.

Mr. SHELBY. We will next hear from Dr. Thomas Malone, Deputy Director of the National Institutes of Health.

Dr. Malone, welcome to the committee.

STATEMENT OF DR. THOMAS E. MALONE, DEPUTY DIRECTOR, NATIONAL INSTITUTES OF HEALTH, PUBLIC HEALTH SERVICE, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Dr. MALONE. Thank you, Mr. Chairman.

Mr. SHELBY. As I said earlier, your written statement will be made a part of the record.

Dr. MALONE. I will simply highlight the basic content of my statement and then be subject to questions by you.

It is a pleasure to appear before the subcommittee on behalf of the Assistant Secretary for Health, Dr. Edward N. Brandt, Jr.

There has been a rather long history of interaction between China and the United States in the health-related fields, but formal agreement between the two governments occurred only in 1979 following the agreement signed by President Carter and the Vice Premier at that time.

Subsequent to that, then Secretary of HEW, Mr. Califano, led a delegation to China and signed the protocol which is now the basis for cooperation in the health and medical field. I was privileged to be a member of that delegation.

The goals of the protocol, I should reiterate here, were to: Promote health and control of disease, advance of knowledge in areas that were common to not only the United States and China, but to all mankind, promote cooperation in science and technology in areas under our consideration, and develop better communication with the People's Republic of China.

I might say parenthetically that this protocol came at a time when I think we had made the greatest contributions to civilization in our own biomedical research effort, certainly in the time subsequent to World War II. I think it is important to embrace all scientists throughout the world in the unprecedented opportunities in science, in what we now call the biological revolution.

The health protocol specified the specific areas in which we would cooperate with the Chinese. These were: Infectious and parasitic diseases, cancer, cardiovascular diseases, public health and health services research, medical information science, immunology, and medical genetics.

This protocol established a joint committee which meets in alternate years in the two countries. The joint committee is cochaired by the Assistant Secretary for Health on our side and initially the Vice Minister of Public Health on the Chinese side. Although it has varied from time to time, the joint committee consists of four senior scientist-representatives in each country.

Since the signing of the protocol we have had two formal meetings and one visit from the Minister of Health of China in 1980, at which time an ancillary agreement was developed. This agreement added several new areas for cooperation: Foods and drugs including pharmaceuticals, mental health, and reproductive physiology and family planning techniques.

At the various joint meetings there have been progress reports of what has been accomplished by the coordinators for each area on the Chinese and the American sides. Subject to their report, the joint committee generally approves of what is being proposed for the future.

I should like to give you very briefly some idea and sense of the thrust of the activities and of what we have accomplished over this period of time.

Right off I can say that there has been a good deal of exchange between the two countries. Our scientists have visited science laboratories in China. We have discussed potential research areas and in like manner the Chinese scientists and health officials have visited our laboratories, and have learned from us. They have learned new technologies for example. This exchange amounts to approximately 150 of our own people going to China and about 100 Chinese scientists visiting and working in this country.

To highlight some of the results of these activities, almost every component of the Public Health Service has been involved in this work and they are specified in our formal report.

In the area of infectious and parasitic diseases I would point out just two examples. We have had a good deal of collaboration in the testing and development of vaccine for hepatitis B, which in addition to producing hepatitis is sometimes associated with the potential for causing cancer of the liver.

We have been testing those vaccines in China, comparing them with the same tests conducted here, particularly investigating whether protection of the mother will prevent the transmission of the virus to the child. We also have been looking at the effects of the vaccines produced in the two countries.

There has been a great deal of research work in the area of malaria, polio, schistosomiasis and other infectious diseases, and there have been some research papers published. We also have worked with the Chinese to establish a breeding colony of primates that can be used in long-term research primarily in the area of cancer, which is clearly of great import to both countries. Overall, we have had a great deal of cooperation.

Just prior to the time we visited China, the Chinese had conducted a massive survey of the prevalence and incidence of various types of cancer throughout the country, mobilizing, I understand, some 2 million workers. When we got there we saw a marvelous display of epidemiological studies of where cancer occurred and where the hot spots were, presenting a marvelous natural laboratory for the study of this dread disease.

We have now developed a number of studies under the protocol, some of these involving our own universities and some which are direct grants to institutions in China.

For example, in a grant to Cornell, a study will be conducted in cooperation with the Chinese Academy of Medical Sciences on the relationship between selenium and cancer. This study will also consider the effects of other dietary components such as beta-carotene and the minerals zinc and molybdenum, on the incidence and treatment and prevention of cancer.

So, we see a number of such activities taking advantage of large stable population areas where there are particular types of cancer, esophageal and other types. There has been an excellent combination of activities between our scientists and the Chinese in this area.

There has been a similar type of collaboration in the area of cardiovascular disease. It is a major killer in China as it is here. There are some important differences between the incidence and types of coronary problems, and we now have mounted several epidemiological studies in the area of cardiovascular disease. These are outlined in the testimony.

In the area of public health and health services research there has been a very detailed collaborative study carried out by two American scientists working with Chinese scientists. They have studied the health care delivery system in Shanghai County and out of that study came 26 papers and a special supplement to the American Journal of Public Health. The study has been said to be a landmark addition to the literature on how health care is organized provided, and financed in China.

There are many lessons we can learn from the Shanghai study. It is going to be of great use to developing countries. It is envisioned that other modalities of health care in Shanghai will be studi[illegible]ch as elimination of measles. In addition, we plan to conduct nutrition and pregnancy outcome surveys. The incidence of low birth weight in Shanghai is much lower than here and we want to find out what we can learn from this.

In the area of biomedical information science, I think one can imagine as a result of the tremendous explosion in knowledge, that scientists have to be close to the literature to understand what is going on in order to conduct research.

Obviously, this is an area of great interest to the Chinese. We have had two scholars become residents in our own National Laboratory of Medicine. They have cataloged ancient Chinese literature, a medical collection of some 800 articles.

In return, we have trained Chinese library experts in modern indexing and cataloging methods. We are discussing access to our computerized Medline system for the dissemination of information to scientists and laboratories. We would expect in the future that they will develop their own computerized hardware systems so that they can link into our system.

In the area of immunology we have conducted a great deal of training in the various techniques in immunology, and some publications have resulted in that area.

We have also collaborated in the area of mental health. One of our scientists has been resident in China and has performed some rather interesting studies on schizophrenia, looking at markers for it and methods of treatment.

The other three areas have reached the exchange stage, but I cannot report to you specific activities at this time. We would expect that there will be future collaborative studies in those areas.

I would like to point out that there are a lot of ancillary activities that have mushroomed as a result of the protocol. There are now some 44 Chinese scientists studying in our own laboratories at NIH.

We know that the National Academy of Sciences has cooperated to the extent that there are many students studying in universities across this country. We also have signed a new agreement, as I indicated earlier, so that we can have additional cooperation in the basic and biomedical sciences.

I should say that, although fostering of trade opportunities is not one of the direct goals of biomedical research, obviously, there must be some fallout from that because in cooperating and collaborating on these various projects the Chinese will have to develop their own technological infrastructure. We know that in working with us they will have to improve their facilities, they will have to acquire some of the latest equipment—from basic supplies and research equipment to the most sophisticated instrumentation.

So, we see that there is an area for growth here and that out of this collaborative work we should get some positive benefits.

I would say in conclusion that we believe we have an excellent record of collaboration up to this point. We have achieved a great deal of cooperation in biomedical research activities and we feel that these developments will increase and the benefits will accrue both to the citizens of China and to this country.

Thank you very much.

[The statement of Dr. Malone is as follows:]

STATEMENT BY THOMAS E. MALONE, PH. D., DEPUTY DIRECTOR, NATIONAL INSTITUTES OF HEALTH, PUBLIC HEALTH SERVICE, DEPARTMENT OF HEALTH AND HUMAN SERVICES

Mr. Chairman and members of the Subcommittee, it is a pleasure to appear before you today to discuss cooperative activities in health betweeen the U.S. Public Health Service (PHS) and counterpart institutions in the People's Republic of China. I am Dr. Thomas E. Malone, Deputy Director, National Institutes of Health (NIH). I have been asked by the Assistant Secretary for Health, Dr. Edward N. Brandt, Jr., to represent the Department at this hearing.

Background of Sino-American Cooperation in Health

There is a long history of interaction between China and the United States in health-related fields, but a formal relationship in these fields between the U.S. Government and the People's Republic of China dates only from 1979. The foundation for that relationship was established when President Carter and Vice Premier Deng Xiao-ping signed the Agreement on Cooperation in Science and Technology on January 31, 1979. That event was followed by negotiations for a cooperative relationship in health. In June 1979, the Secretary of the U.S. Department of Health and Human Services (HHS), led a U.S. delegation to the People's Republic of China and signed the Protocol for Cooperation in the Science and Technology of Medicine and Public Health. I was privileged to be a member of that delegation and participate in the discussions which led to the signing of the Health Protocol.

The goals of the Health Protocol include:

- The promotion of health and control of disease;

- The advance of knowledge in resolving common problems in medical science and public health for the benefit of all mankind;

- The promotion of cooperation in the science and technology of medicine and public health; and

- The development of better communication and understanding between the medical and public health communities in both countries.

The Health Protocol specified the subject areas in which cooperative activities initially would be undertaken: infectious and parasitic diseases; cancer; cardiovascular diseases; public health and health services research; medical information science; immunology; and medical genetics. The Protocol also established a Joint Committee for Cooperation in Medicine and Public Health as a mechanism whereby the two countries would determine overall policies and procedures for carrying out the cooperative program.

The Joint Committee is co-chaired by the Assistant Secretary for Health, HHS, representing the U.S. side, and the Vice Minister of Public Health, representing the Chinese side, and includes five senior representatives from each country.

At the time of the signing of the Protocol in June 1979, the Joint Committee had its first meeting in which I participated. During that meeting the discussion focused on potential areas for scientific cooperation and agreement was reached on a specific set of cooperative activities within these areas. It was also decided that the cooperative activities for each area would be planned and overseen by coordinators designated by the Joint Committee Co-chairmen.

This Protocol governs only the cooperative activities agreed upon between the components of the U.S. Public Health Service and the Chinese Ministry of Public Health. On our side, it does not govern other cooperative activities that might be undertaken by the PHS or by nongovernmental parties, such as universities, foundations, industry, and individuals.

Since those initial events, cooperative activities have proceeded vigorously. Coordinators and their colleagues from the two countries have exchanged visits, shared ideas on important research issues for joint pursuit, formulated cooperative program plans, and proceeded with active implementation of those plans after approval by the respective sides.

The cooperative relationship was enhanced by the visit to the United States by the Chinese Minister of Public Health, Qian Xinzhong, in June 1980, when he and his delegation were received in Washington, D.C. by the Secretary, HHS. The Minister visited a number of cities and health programs in various parts of the United States and also made contacts in the private sector. During this visit, Minister Qian indicated that his Government wished to accelerate and expand the cooperative program in health. Accordingly, the decision was made to extend cooperative activities into three new areas: foods and drugs, including pharmaceuticals; mental health; and reproductive physiology and family planning techniques. Coordinators were subsequently designated, and planning in the three new areas was initiated.

At the second meeting of the Joint Committee, which took place in Tianjin, China, November 14-20, 1980, representatives for each of the ten areas of cooperation discussed progress in their joint work and also participated in a scientific symposium on the epidemiological aspects of the various areas of cooperation. The Joint Committee approved plans for cooperation in the ten areas, including a new initiative in health services research.

The third meeting of the Joint Health Committee, in which I also participated, took place in November 1982 and was held at the NIH campus in Bethesda. At this meeting plans for research and scientist exchanges were reviewed by the scientific area coordinators and the Joint Health Committee. An updated program of research activity and exchange visits was approved by representatives of both sides and that program is now being carried out.

To give you some idea of the level of activity that has taken place under the Health Protocol during the past four years, we estimate that approximately 150 U.S. health officials and scientists have visited and worked in China while approximately 100 Chinese health officials and scientists have visited and worked in the U.S.

Status Report

I would now like to briefly summarize the various areas of scientific cooperation under the Health Protocol and indicate the status of exchange activities and research in each area. The components of the PHS involved in this work include the:

- Alcohol Drug Abuse and Mental Health Administration
  - National Institutes of Mental Health
- Centers for Disease Control
- Food and Drug Administration
- Health Resources and Services Administration

National Institutes of Health

National Cancer Institute

National Heart, Lung, and Blood Institute

National Library of Medicine

National Institute of Allergy and Infectious Diseases

National Institute of Child Health and Human Development

National Institute of Environmental Health Sciences

I. Infectious and Parasitic Diseases:

Cooperation in the area of parasitic diseases, through the exchange of scientists, has advanced plans for a national primate center in China to serve research needs in malaria, polio, and other infectious diseases. During the past three years, cooperation has led to the development of a breeding facility, from the conceptual stage to full operation, to meet China's long-term needs for research animals.

Collaboration in hepatitis has been especially active, with projects in China for testing the efficacy and delivery system for vaccine and in developing and testing Chinese-manufactured vaccine. Cooperation has made possible an ongoing study of mother to infant transmission of hepatitis B and testing whether use of the vaccine alone will interrupt this transmission. Cancer of the liver, which has been linked epidemiologically with prior hepatitis B infection, is a leading cause of death in males in the P.R.C. This research has great potential significance for both countries.

II. Cancer Research:

Under the Health Protocol, the successful culture of human esophageal and hepatic tissues has been used in the study of possible carcinogens such as aflatoxin B1, an etiological factor in liver cancer, and T2 toxin, a mycotoxin which is possibly involved in esophageal cancer. A new screening test for Human T cell Leukemia virus (HTLV) using sera from Chinese monkeys with anti-HTLV antibodies will result in joint publications in the international literature.

As a result of contacts fostered under the Health Protocol, major epidemiological investigations are now under way in China, directly supported by NIH's National Cancer Institute (NCI). In a grant to Cornell University, a study will be conducted on 18,000 persons in China in cooperation with the Chinese Academy of Medical Sciences. The research will evaluate the relationship between selenium and cancer, as well as the effects of other dietary components, such as beta-carotene, vitamins A, B-2 and E, and the minerals zinc, molybdenum and iodine. China's recent completion of a comprehensive national cancer mortality survey, coupled with the population's stable food intake and low migration patterns, make such studies in China a unique opportunity that can provide both U.S. and Chinese scientists with information on the potential causes of cancer which would be far more complex to discern if studied in the U.S. population alone. The research team will also investigate the correlation between cancer and cotinine, serum high density lipoprotein, dietary fiber, and several enzymes indicative of diet.

In a separate contract between the NCI and the Chinese Cancer Institute, case control interview studies of lung cancer in Shanghai, esophageal cancer in Linxian, stomach cancer in Shenyang Province, choriocarcinoma in Beijing, and developmental work for a case-control study of penile cancer in South Central China, are now being initiated.

III. Cardiovascular Disease:

Cooperation in this area under the Health Protocol focuses on a comprehensive program of joint research on the epidemiology, etiology, and natural history of the major adult cardiovascular diseases, particularly hypertensive and atherosclerotic diseases in Chinese populations. Epidemiological data on approximately 8,000 urban and rural residents in North and South China will be collected. These data will be compared with existing data on the U.S. population, thus enabling unique comparisons between two countries that differ vastly in cultural, socio-demographic, genetic, dietary, and other lifestyle characteristics. Several joint publications in the international literature have already resulted from this collaboration.

Cooperative activities outside the Health Protocol in the area of cardiovascular diseases include a grant by the National Heart, Lung, and Blood Institute (NHLBI) to Shanghai Children's Hospital. This study on hemoglobin abnormalities will provide new information on the understanding of thalassemia and other hemoglobin disorders. Access to blood specimens from China is a unique and important contribution to understanding these disorders.

IV. Public Health and Health Services Research:

The first collaborative investigation carried out in the area of public health and health services research was a descriptive study of health services research in Shanghai County. To carry out this study, two American scientists, one from the Centers for Diseases Control (CDC) and one from Johns Hopkins School of Hygiene and Public Health, spent three months in Shanghai working with counterparts from the School of Public Health of Shanghai First Medical College, and the Shanghai County Bureau of Health. Their studies were summarized in a workshop held in Shanghai in July 1981, and subsequently published in both countries. The version in English was published as a special supplement to the American Journal of Public Health in September 1982. In an editorial about this publication in the same journal, Dr. Myron Wegman characterized the work as a "landmark in the U.S. literature on China" with the papers on health care organization, financing, and costs being singled out as containing "significant information not previously available." The editorial concludes that "the variety of content and perspective achieved in the wide ranging series of articles in health services in Shanghai County are a major achievement and will constitute an almost unique resource not only for students of public health in China but for all interested in adapting lessons to be learned from abroad for use at home."

Futher studies in the Shanghai County area are now being developed to include:

1. Measles Elimination
2. Nutrition Survey
3. Risk Factor Survey/Health Risk Appraisal
4. Pregnancy Outcome
5. Update on Health Services

The possibility of eliminating measles in China is very much of mutual interest to the U.S. and the P.R.C., especially since the U.S. has now almost completely interrupted domestic transmission of measles. Importation will soon be the only source of measles in the U.S.

Also included under this area are studies related to environmental and occupational health. Exchanges of personnel and collaborative projects are being discussed this week.

V. Biomedical Information Science

In this area, two Chinese scholars have assisted NIH's National Library of Medicine (NLM) in identifying, verifying, and cataloging NLM's ancient Chinese traditional medicine collection. In return, NLM has trained two Chinese library experts in modern indexing and cataloging methods. Discussions are continuing to develop the computer hardware and software in China needed for them to be able to use NLM's on-line medical information system (MEDLINE).

VI. Immunology

A series of seminars were conducted in Beijing in August 1983 to identify areas for collaborative research. The areas chosen for cooperation are:

- Epidemiological studies of asthma and allergic diseases under differing socioeconomic, geographic, and environmental settings;
- Study of the linkage between parasitic and allergic diseases; and
- Study of certain types of immunologic diseases, such as lupus erythematosus, in relation to environmental and genetic factors.

Numerous research publications have resulted from the several Chinese scientists who have worked at NIH with U.S. counterparts in immunology.

VII. Mental Health

In this field there has been a particularly productive exchange of scientists working in each other's laboratories over the past few years. Chinese scientists at the National Institute of Mental Health

(NIMH) in the U.S. are learning techniques for assaying genetic markers for schizophrenia. A scientist from NIMH worked for over a year in Beijing and Shanghai where he helped to establish laboratory facilities and to initiate clinical studies of psychiatric disorders. Joint publications on this work are now being prepared.

VIII.-X. Remaining Areas

In the three remaining areas, Human Genetics, Reproductive Physiology and Family Planning Techniques, and Food and Drugs, there have been reciprocal exchange visits for the purpose of establishing initial contacts and to define areas of cooperation. The current focus is on arranging for research experience in the U.S. for a cadre of Chinese scientists for future collaborative studies, and in exchanging information and research reagents.

Additional Activities

In addition to the cooperative activities described above, most of which have been developed under the Health Protocol, there are a variety of exchanges and collaborative research activities that take place between the PHS and Chinese counterparts under other mechanisms. For example, there are more than 40 Chinese scientists working in the NIH intramural laboratories under our Visiting Scientist and Guest Researcher Programs.

We also have recently signed a new agreement between the National Institutes of Health and the Chinese Academy of Sciences for cooperation in the basic biomedical sciences. This agreement is intended to foster collaborative research between some of the best basic research laboratories in our two countries. A sub-agreement links the Shanghai Brain Research Institute and the National Institute of Neurological and Communicative Disorders and Stroke. This program is just getting under way.

On August 1, 1983, the Ministry of Public Health of the P.R.C. established a National Center for Preventive Medicine (NCPM) in Beijing with features similar to the U.S. Centers for Disease Control (CDC). The NCPM employs about 1500 persons and is constituted from the Institute of Health, the Institute of Epidemiology and Microbiology, the Institute of Virology, the Institute of Parasitic Diseases, and the Laboratory of Industrial Hygiene. The World Bank is assisting the NCPM with financial support. A Memorandum of Understanding regarding cooperation between the NCPM and CDC is now being discussed.

Relationship of Health Protocol Activities to Increased Trade

Although fostering of trade opportunities is not one of the goals of the Health Protocol, from the start of the relationship, both sides recognized the need for China to develop a technological infrastructure which would enable active participation in state-of-the-art biomedical research and lead to improved health care delivery. During our exchange visits, we have learned much about what the Chinese have accomplished in improving the health of their people with relatively little in the way of high-technology and equipment but with much hard work and organization. On their visits to the U.S., Chinese health officials and scientists have been exposed to the best facilities and equipment we have to offer. There is much, from basic supplies and research equipment to the most sophisticated autoanalyzers and brain scanners, that the Chinese have indicated an interest in acquiring.

The training of large numbers of Chinese health scientists in this country will do much to establish long-term potential for trade and exchange. Furthermore, our collaborative work often necessitates the use of identical equipment so that techniques and results are more easily compared and analyzed.

Conclusion

The U.S. Public Health Service is proud of its record of cooperation with China and we believe that we have achieved much in working toward common goals. We have aso helped to establish many useful contacts and relationships that go beyond the scope of our formal agreements.

By the end of 1981, the National Academy of Science's Committee on Scholarly Communication with the People's Republic of China was already reporting over fifty agreements between U.S. and Chinese academic institutions. We understand that many of the leading U.S. medical schools now have direct relationships with Chinese institutions and NIH is beginning to see more grant applications related to research to be conducted in China. The Health Protocol has served a very useful function in bringing about this collaboration and in helping it expand into the private sector. We are pleased by these developments and feel that our cooperative activities in health will have far reaching benefits to the citizens of both countries.

I will be pleased to respond to any questions.

Mr. SHELBY. Dr. Malone, we appreciate your testimony.

Congressman Swift, do you have any questions?

Mr. SWIFT. Thank you very much.

Let me talk a little bit about environmental health research with EPA.

First of all, I am sorry I was not here for your entire testimony and I apologize for not being here.

When we were in China, Congressman Ottinger lead a subdelegation to meet with Qu Geping, Deputy Director for Industrial Construction and Environmental Protection, he raised with us in fairly strong terms that they feel there had been a commitment on the part of the United States to move ahead vigorously in this area and that it hadn't happened.

We, in fact, had intended to hold a hearing of this subcommittee on this issue alone. We understand, however that some progress has been made in this regard and, as a result, we decided not to hold a hearing on this issue alone.

But I would like to explore with you a little bit at the present time. The complaint, as I understood it, was that the United States was only going to spend $700,000 in 5 years while the Chinese will spend $1½ million each year.

Could you explain for me why the United States is spending so little and are the Chinese really spending that much.

Mr. GREEN. It is startling to be told by the Congress that we are not spending enough money.

Mr. SWIFT. There are a few of us left.

Mr. GREEN. I wasn't there, of course, during these complaints. I have heard them translated in this way.

What we don't really know is how they figure the amount of money they are putting into it. I think that our total expenditure in this direction is going to be something probably totaling another $100,000 before we are through on this project.

Mr. SWIFT. Which would bring it to a total of——

Mr. GREEN. $800,000 plus.

I think it is important that we sit down and respond to the complaint they have made to you in a specific way. We will have some time with them next month, as I mentioned in my testimony.

We are very concerned that they see that it is a two-way street. We certainly do.

Mr. SWIFT. I know Chairman Ottinger feels strongly that this is an important area for cooperation intrinsically, in addition to the trade potential, and that reneging or dragging our feet in the area of environmental protection would not be appropriate.

I must say we are pleased to see indications that that policy is reversed and that you are moving ahead. I gather this is still an issue between EPA and the Chinese, the amount that we are spending versus the amount they say they are spending.

What you are telling me is that it is your intent to explore that with them and try to find out with a little more specificity exactly what their concerns are and to evaluate that after you have had those talks; is that correct?

Mr. GREEN. That is right, Mr. Chairman. We certainly intend to do that.

Mr. SWIFT. Has the 2- to 3-year delay in getting their work on research started been due primarily to this funding disagreement?

Mr. GREEN. I don't know how much has been caused by that factor. Other factors may have been bureaucratic, in both countries. In the period from 1981 through the early part of this year there were changes in personnel in our agency. There were also changes in the organization of the Chinese Government organization.

During the troubles in our agency, there were reductions in our research budget which curtailed seed money for this kind of venture. I think it is understandable that these delays took place, but we foresee no excuses ahead of us. We don't intend to make any.

It is a lengthy process, as I am sure you know, Mr. Chairman, at this distance, both culturally and in terms of miles, to get sensible projects going. They will come over here, for example, next month and normally that would signal a proposal, for a new project.

We would then study it and send back a counterproposal and they would study it and we would meet again and try to implement the project.

We have a project going right now on the relationship of the burning of coal to lung disease. We are well underway on that.

A number of projects have been discussed, 7 out of 10, which have not reached the active cooperative stage envisioned in the protocol. We hope to speed up the process when they get over here.

Mr. SWIFT. We want to look on this very positively. We know that it is a problem.

I gather from what you are saying, and I don't mean to put words in your mouth, but you are committed to follow up with this protocol at EPA now?

Mr. GREEN. That is correct.

Mr. SWIFT. Is there any chance that the unspent funds could get pulled back for budgetary reasons by the program office?

Mr. GREEN. I am not sure which unspent funds you are talking about.

Mr. SWIFT. That are used for this project.

Mr. GREEN. We intend to spend the amount of dollars that have been reserved for this project. There are not any unspent funds that I know of that are being held back. We are not impounding any funds, if that is the drift of your question.

Mr. SWIFT. This committee would very much like to know if in fact you find out that money that you anticipated using to be able to pursue this project begins to disappear on you?

Mr. GREEN. There has been no indication that that is going to happen.

Mr. SWIFT. We are pleased to hear that. If you get any indications, will you let us know?

Mr. GREEN. Yes, sir.

Mr. SWIFT. One last question.

When does the annex to this protocol expire?

Mr. GREEN. I don't know, but Dr. Waxmonsky does.

Mr. WAXMONSKY. The entire protocol expires in February 1985. It would then be up for renewal in February 1985.

Mr. SWIFT. But this particular annex 1, does it expire with the protocol?

Mr. Waxmonsky. Yes, sir.

What you may be getting at is the fact that research for the lung cancer study is scheduled to proceed for 5 years from initiation which would take it beyond the termination date of the basic protocol, but we fully anticipate that the protocol and its annexes will be renewed at that time.

Mr. Swift. We have lost a lot of valuable time. It seems to me that the greater the vigor with which it is pursued now, the more lost time we regain.

I want to compliment the agency for a much more positive approach on this. We will be watching with care. We want to give you as much support as we possibly can in pursuing that vigorously.

Mr. Waxmonsky. Thank you, Mr. Chairman.

Mr. Shelby. We have a vote on the floor. We are going to stand in recess here for about 10 or 15 minutes.

If you gentlemen will stay, we will have some more questions.

[Recess.]

Mr. Swift. Thank you very much for waiting while we had that vote. I appreciate your cooperation in that regard.

I think I will go ahead and ask some more questions of the EPA.

We talked a little bit about annex 2 that deals with the environmental pollution control. This, as I understand it, is the portion of the protocol where there has been no activity.

Mr. Green. Correct.

Mr. Swift. Why is that?

Mr. Green. We don't know. We are going to explore what possible reasons there may be when the Chinese arrive in December.

Mr. Swift. That is an area in which there ought to be some really good trade opportunities for American business.

Mr. Green. It is the only logical area for immediate payoff.

Mr. Swift. We found in our discussions over there that while they are structured economically very differently than we are, they have some of the same problems. Namely, if you are the head of an industry whose responsibility is to up production, you don't take very kindly to pollution control restrictions which reduce your ability to do it.

Hence, there is tension within the Chinese Government in this very area, too, with those charged with trying to preserve the environment, trying very hard to do it, and meeting resistance from those in charge of production.

It may be that one side is winning right now and that is the reason there hasn't been any movement.

Why do you think the 1980 Trade Fair on Pollution Equipment was a failure?

Mr. Green. Again, I wasn't around at that time, but my understanding is that we really don't know the reason other than the fact that possibly for the points you have just made, Mr. Chairman, pollution control activity has not risen to the sophisticated levels it has in this country because it is too expensive.

They tend to respond to the problems of environment at a less sophisticated level. Wherever possible they simply recycle materials that we would dispose of, for example.

Mr. SWIFT. Without knowing with precision why that didn't work out well, there is no way of knowing whether in 1983 or 1984 a repeat would be any more successful.

Mr. GREEN. This is a question that we can address with them when they come here. We will be happy to raise it with them. Presumably they have some thoughts on it.

Mr. SWIFT. I understand both from the committee visit to China and from recent descriptions of the Chinese environment that they face enormous problems with air and water quality, waste disposal and virtually every other environmental protection area. Certainly the haze in Beijing is something to behold.

Do we have a good sense of how the Chinese are addressing these problems as they launch this new effort to get into a position to massively improve industrial development?

Mr. GREEN. The only thing we can say with any firmness is that having determined to quadruple their production by the year 2000, looking at the Yellow Dragon as I gather some of them call this air pollution to which you refer, they say, well, maybe we had better start thinking on how we protect ourselves as we go toward these goals, and that is the reason for having the environmental bureau formed at this time.

Frankly, I personally hope to get to know a lot more about how they intend to go about this. Our office is sketchy. If Dr. Waxmonsky can add anything, I am sure he will try.

Mr. SWIFT. Please.

Mr. WAXMONSKY. Thank you, sir.

On the basis solely of reading of the Chinese press on this problem, it seems that their stated goal for the current 5-year plan is simply to keep the problem from getting worse and then to try to focus on certain key localities, the big cities and the tourist centers, if you will, and try to improve the environmental situation in those particular places.

They do realize that clearly if they are going to quadruple their agricultural and industrial production by the end of the century, they have to get started now. Otherwise the environmental problems they will face in the year 2000 will be far worse than they are presently. It will go up in geometrical proportion.

They really will not deny that they have to tackle this problem gradually.

Mr. SWIFT. Thank you very much.

If I understand you, you are essentially saying that we really don't know why we have not made any progress on that annex. It is essentially because the Chinese have not shown interest to date and you are going to explore with them whether or not we can get something going on annex 2 when you have an opportunity?

Mr. GREEN. That is correct, Mr. Chairman.

Mr. SWIFT. We will be very interested in talking with you after that meeting either informally or if not in a hearing.

Mr. GREEN. If you wish Mr. Chairman, we can report later how we discover answers to these unanswered questions.

Mr. SWIFT. That would be very good. We would appreciate that very much.

I understand that Mr. Qu is going to be visiting the United States at the end of this month including a stop in Washington next month; is that correct?

Mr. GREEN. That is correct. There will be eight of them all told.

Mr. SWIFT. Can you advise us of their specific schedule? I don't know if that is set yet.

Mr. GREEN. We are in touch with your staff on this, Mr. Chairman.

It looks as though they are only going to have one working day while they are in Washington. We will certainly try to divide the schedule in any way that is helpful to you.

Mr. SWIFT. If it is possible to have a meeting with them in so brief a schedule, we would like to examine it. I am sure we want to be sensitive to what would get displaced if we met with them, but we at least would like to talk to you.

Can you comment a little bit on how such visits as that result in new research projects and how these projects can then be proposed and approved within the EPA?

I am just asking for the process that you use there.

Mr. GREEN. What we try to do in all these cooperative research efforts is to minimize paperwork ceremonial activity and stick to getting something done.

With the Chinese, because of all of the difficulties in getting anything done, our intent is to have effective proposals.

Normally, the way it works is that the visiting team or their host will make a proposal, the other side will take it back to their country, study it, make a counterproposal, get comments from the proposer, and then get together for a final meeting to fix the details of an actual project. An example is the current one on the health effects of burning coal in doors.

Mr. SWIFT. Thank you, Mr. Green and Dr. Waxmonsky. We appreciate your help. We will be submitting some questions in writing and holding the record open for your written responses on those.

If you would like to leave at this time, you are free to go. We have just a few more questions for Dr. Malone.

Thank you very much for your participation.

Mr. GREEN. It is a pleasure, Mr. Chairman.

Mr. SWIFT. Dr. Malone, we will also be sending you some questions in writing.

Do you expect to collaborate on projects related to environmental and occupational health? Can you tell us the target industries and the occupations in those studies.

Dr. MALONE. Yes. The environmental health and occupational health portion of the protocol is under the public health research and health services area.

We have had some exchanges since 1980. Two of our scientists have visited China and four environmental scientists have come to us to discuss possible collaborative projects.

Those proposed activities which are not yet underway, but which are in planning stage, will look at the impact of and fix on the details of an actual project such as this one we are at work on now on the health effects of burning coal.

Mr. **Swift**. Thank you, Mr. Green and Dr. Waxmonsky. We appreciate your help. We will be submitting some questions in writing and holding the record open for your written responses on those.

If you would like to leave at this time, you are free to go. We have just a few more questions for Dr. Malone.

Thank you very much for your participation.

Mr. **Green**. It is a pleasure, Mr. Chairman.

[The following was received for the record:]

EPA RESPONSES TO ADDITIONAL QUESTIONS FOLLOWING THE NOVEMBER 3, 1983 HEARING ON UNITED STATES-CHINA PROTOCOLS

Question 1. What, specifically, do you expect the U.S. will learn from the cooperative research under Annex 1? Is the Chinese air pollution problem that bad, and are the advantages from an epidemiological standpoint of doing this work in the PRC great enough to justify the project on scientific merits?

Answer. The Xuan Wei study offers a number of advantages which would be difficult or impossible to find in the U.S. First of all, we have in Xuan Wei a population which is exposed to the risk factors we're concerned about in this country, but which is large enough to offer a good sample, and far more stable, less mobile, than populations available in this country. This makes for much greater confidence in the results obtained.

This project also offers a unique and important opportunity to run bioassay tests on samples from the same region which is being studied epidemiologically. It is very unusual for epidemiologic data and bioassy samples to be collected at the same time and place.

Even by themselves, epidemiological studies are expensive and do not typically offer short-term payoffs. We will benefit from the Chinese willingness to do the actual sampling and monitoring work over a period of several years. The success of this project depends less heavily on high technology than on diligence, patience, and ingenuity. The Chinese are well endowed with these qualities.

In Xuan Wei, we can study the interactions of several specific key risk factors without having to be concerned about a large number of other factors which would confound a similar analysis done in the U.S. The environment in this country tends to be too complex for such finely-tuned studies.

Finally, the Xuan Wei research will generate new and improved bioassy and sampling methods which may prove quite valuable to subsequent research done in this country. In short, this project will generate good tests as well as good data.

Question 2. Are there any specific annex 3 projects now under discussion, such that you conld anticipate research programs that will result from the December visit of Qu Ge Ping?

Answer. We are close to initiating a joint study on atmospheric transport and transformation, which has already been agreed upon by both sides. Additionally, our specialists have been talking to the Chinese about a joint study on modeling environmental concentrations of conventional and toxic pollutants in the water supply of Changzhou city in order to develop optimum management strategies. This project would permit us to field test our state-of-the-art environmental process and exposure models at great savings.

However, the visit of Mr. Qu and his colleagues is not ideally timed in terms of the Agency's fiscal year 1985 budget planning cycle. It would, therefore, be difficult for us to commit to specific joint research projects during the delegation's stay in the U.S. Of course, this will not prevent our scientists from discussing specific research topics of mutual interest. Indeed, this is how meaningful joint research efforts are born.

Question 3. As part of the work done under Annex 1, EPA exported to the PRC a Finnigan Model 4510 gas chromatograph/mass spectrometer which needed an export license from the Department of Commerce. How long did it take to obtain this license? Do you believe the delay, if any, was at the Department of Commerce or because of the mutilateral export controls process?

Answer. We are quite satisfied with our experience in securing the export license for loan of the GCMS to the Chinese under the Protocol. It is our understanding that the Cocom review by itself can normally be expected to take 60–90 days. In our case, it was completed in about seven weeks, and the whole licening process, from submission of the request to notification of approval, took over three months. I must say that the diligence and thoroughness of the principal EPA researcher may have played a role in facilitating the ultimately happy outcome. Considering their workload, we found the officials at the Office of Export Administration to be agreeable and responsive to our concerns.

Question 4. In December 1982, Dr. Charles Chapman[1] of EPA tried to get a project case file at Commerce for all export licenses for Annex 1 work. Commerce refused to set up such a file, but did attempt to informally coordinate the applications. Did this informal coordination process work?

Answer. We are satisfied that Commerce/Office of Export Administration did all it could to accommodate our specific case without disrupting its licensing system. Again, judging from the final outcome, we must say that the informal coordination process was effective.

Question 5. How much of a problem was it that Commerce could not give EPA pre-clearance advisory opinions as to which equipment and materials would require export licenses?

Answer. Obviously, from the standpoint of the export license applicant, it would be most helpful to know beforehand precisely which commodities require a validated license and which do not. At the same time, one can understand that this may not be practical considering the volume of paperwork such an arrangement would generate. In our experience to date, the non-availability of a pre-clearance advisory opinion has not been a significant problem.

Question 6. Could you please describe the EPA budget process in terms of funding for cooperative activity under the protocol? In addition, could you provide a detailed review of EPA expenditures under the protocol?

Answer. The question of budget process for cooperative activity under the Protocol is rather difficult in that only one major project has been funded to date. On the basis of this limited experience, it seems fair to say that the process is a function of coordination among the particular ORD lab involved, ORD headquarters (office directors and the Assistant Administrator for Research and Development), and the Office of International Activities (OIA). After face-to-face discussions with Chinese colleagues, a scope of work and budget are submitted by the lab. The level of funding is reviewed at ORD headquarters in consultation with the OIA, whereupon the China research activity becomes a part of ORD's normal budget submission. Subsequent funding increments are initiated and processed in similar fashion. Funding withdrawals or "taps" have not been a problem. Given the Administration's strong and consistent support for scientific and technological cooperation with the PRC, once a proposal has been approved within ORD and funding allocated, such moneys remain securely dedicated.

EPA expenditures to date under the Protocol are presented below:

Budget account/program budget	Fiscal year	Amount
Various EPA travel accounts (estimated)	1980	$32,500
Various ORD travel accounts (estimated)	1981	26,400
Drinking water/health effects	1981	2,100
Drinking water/health effects	1982	1,700
Toxics/health effects	1982	2,600
Gases and particles/health effects	1982	76,000
Gases and particles/health effects	1983	340,100
Oxidants/health effects	1983	83,000
Water quality/env. processes and effects	1984	12,000
Drinking water/env. processes and effects	1984	....
Hazardous waste/env. processes and effects	1984	....
Oxidants/env. processes and effects	1984	....
Gases and particles/env. processes and effects	1984	5,800
OIA travel account	1984	8,900
Gases and particles/health effects	1984	....
Total		591,100

Mr. SWIFT. Dr. Malone, do you expect to collaborate on projects related to environmental and occupational health?

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[1] Note: Dr. Chapman's given name is Robert, not Charles.

Can you tell us the target industries and the occupations in those studies.

Dr. **Malone**. Yes. The environmental health and occupational health portion of the protocol is under the public health research and health services area.

We have had some exchanges since 1980. Two of our scientists have visited China and four environmental scientists have come to us to discuss possible collaborative projects.

Those proposed activities which are not yet underway, but which are in the planning stage, will look at the impact of coal dust in producing disease, cotton dust and heavy metals and toxicology studies on effects of production and development.

Those are the areas that will be subjected to study in the immediate future. They are in the planning stage.

I would suspect that there will be other projects. At the moment it involves only the areas cited earlier.

Mr. **Swift**. How will the public health service coordinate this work with the EPA?

Dr. **Malone**. This will probably be coordinated through the State Department. The State Department Executive Secretary periodically calls together all of the involved agencies under the agreement, and we would expect in those sessions to have some exchange. But in addition, I think that our scientists would have some direct contact with EPA scientists as they develop these projects. But we would rely rather heavily on the formation at the State Department level.

Mr. **Swift**. Essentially going through State as the coordinating agency?

Dr. **Malone**. Yes.

Mr. **Swift**. And then some limited direct contact?

Dr. **Malone**. Scientist to scientist.

Mr. **Swift**. Do you have to OK that with State? How do you know when you can do that?

Dr. **Malone**. We have actually had no constraints on the scientist-to-scientist contacts at all. The Department of State generally calls its meeting periodically to try to handle the problems we have, such as in the export area, export regulations, and things of that sort. But we have had no constraints in terms of scientist-to-scientist communication.

Mr. **Swift**. You have no problem interfacing with EPA?

Dr. **Malone**. We do not.

Mr. **Swift**. It gets taken care of one way or another?

Dr. **Malone**. Yes.

Mr. **Swift**. Are there any implications for environmental control equipment based on this plan? By implications I mean long-term future needs.

Dr. **Malone**. I would say our interests in the Public Health Service is on the impact of the agents causing disease. If we can demonstrate that environmental controls are needed, I would think that that would be an area in which the EPA would be able to provide some advice to the Chinese Government, just as we have that distinction in this country.

Mr. **Swift**. What can we learn from the health care organization financing in China?

One thing we learned is don't get sick there if you are a foreign dignitary or they will keep you in the hospital forever to make sure you are well because they don't want anyone to suggest they weren't well taken care of while they were in China.

What can we learn from them in terms of the structure?

Dr. MALONE. As I pointed out during the testimony, we have only had one rather excellent study of the entire health system in the exchange Shanghai district. That study has produced 26 papers.

The results have run all the way from how the Chinese finance their health care system to how they are able to manage to get immunizations, the utilization of health workers, and the eradication particularly of infectious diseases.

They have done very well with this. We hope there may be some lessons that we can transfer from these studies. The Shanghai study, as one example, has revealed through its survey that there is a negligible low birth weight problem in Shanghai County.

Mr. SWIFT. By birth weight problems, what do you mean?

Dr. MALONE. Low birth weight babies. They have a much lower incidence of low birth weight babies than we do here, significantly lower. This came out of looking at their health care system. We want to find out what causes this, what are the factors and obviously transfer that to our own health care system because it is a significant problem with us.

While many of their techniques may be more applicable to developing countries, and we feel a responsibility to share that with the developing countries as well, there are many things from such studies that we can learn and also adapt to our own system because we don't have the best health care system in the world in some sectors and in certain segments of our society.

Mr. SWIFT. One I suppose has to ask about acupuncture. I know that we are doing some work on that in this country as well.

Do we have some things to learn there?

Dr. MALONE. Yes; I think we do. Acupuncture obviously goes back quite a few centuries. One of the interesting things that one might see in a given commune in China is that patients can avail themselves of both western orthodox medicine, acupuncture, as well as traditional medicine. One sees it being used for a variety of ailments, many diseases, for hearing loss, and things of that sort.

I think the legitimacy of that has to be examined on a scientific basis. Our discussions with the Chinese have led to their willingness to have acupuncture examined from that standpoint. Indeed, a few years ago at NIH, we put out a call for applications in this area, but we didn't get a large response.

One of the things I am personally certain of is that acupuncture anesthesia does work. I have seen it work and watched an operation on a young lady whose tubes were being tied for antifertility purposes and acupuncture needles were applied for 50 minutes and enhanced by some electrical stimulation.

I had my camera poised to look at the incision and to watch the lady scream. The operation was carried out in 15 minutes on each ovary with no drugs and no pain. She was sewed up and wheeled away in quite good comfort instead.

I think there are some scientific reasons for this. Undoubtedly, the acupuncture releases antipain substances in the brain, the so-called endorphins and there is a great deal of work going on in China to validate what acupuncture can do. I would suspect that it would not be possible to use acupuncture anesthesia for a long operation, 2 or 3 hours or longer, but it would certainly work on a short-term basis. I think acupuncture is certainly in vogue in certain parts of this country and it will behoove some scientific elucidation of the mechanisms of action of acupuncture where it is successful.

Mr. SWIFT. They are cooperative?

Dr. MALONE. Very cooperative. One of the things that I have been impressed by in the area of science is that the Chinese scientists have been absolutely open. They have shared their research papers with us. They have discussed their activities. They have opened their laboratories to us. We have had very few problems in communications with the scientists or with those who are in charge of the health institutes.

Mr. SWIFT. Dr. Malone, I am going to yield the chair to Mr. Sikorski who has a few questions.

I want to thank you personally for spending so much time with us.

Mr. SIKORSKI [presiding]. Dr. Malone, we had occasion to review the aspects of the Shanghai County health system which was impressive, everything from the bare foot doctors to the sophisticated practice or provision of medical care.

I am wondering if perhaps related to the low birth weight situation is the extensive prenatal care system that they have. They are very effective in terms of family planning and from that point on they are very effective in terms of their health care.

I am wondering, on the whole their preventative care system seems to be good.

I am wondering also if Shanghai is representative of the Nation because it is wealthier, it does have extensive agricultural interests that are now the wealthiest apparently in the Chinese society and it has historically been accessible to good food, fiber supplement, and everything else.

Dr. MALONE. First, I would certainly agree that the business of prenatal care is something that we can learn from the Chinese and determine if there are applicable technologies that can be applied here.

When I was in Shanghai I had the same impression that we might have been looking at the Waldorf Astoria of some of the communities in China. However, when one looks at the data, say, from the World Health Organization in terms of their successes in meeting infectious diseases, it turns out to be sort of a countrywide phenomenon, perhaps exaggerated in Shanghai. They are able to apply the system of immunization to large segments of the population, something which we have not been entirely successful in doing in this country.

I would certainly agree both in terms of living accommodations and provision of medical care that Shanghai is undoubtedly a model area.

Mr. SIKORSKI. Our review of health programs and medicine in China suggests medical care depends on a large and regionalized pharmaceutical industry. The Chinese use drugs intensively in the practice of medicine.

There are still many untested drugs currently being used in China. Your work on the hepatitis project provides some interesting insights in this regard.

Can you tell us about other opportunities to collaborate with the Chinese on drug research? Can such research lead to trade and venture opportunities for our American pharmaceutical industry and how do patent laws and concerns for patent laws relate to this?

Dr. MALONE. First, I would say that the area of food and drugs is one of the relatively recent additions to activities under the Health Protocol and most of the activities in this area have been exploratory.

The Chinese have made their own hepatitis vaccine and we are in the process of comparing it with the quality of the vaccine here. They have exported some bulk pharmaceuticals to this country, such as analgesics. The FDA is looking at the quality of those drugs.

I would suspect that as we improve our research capability in China, as there is a greater demand for reagents, for vaccines, for antibiotics, things of this sort, that there should be an increasing market at least initially for this country. I would also suspect, however, that over time the Chinese will develop their own capability to develop their own supply of drugs, but will require, even if that happens, a large amount of consultation with drug houses in this country.

Mr. SIKORSKI. Will they perhaps gain this expertise at the expense of American pharmaceutical company patents?

Dr. MALONE. I do not know of any patent problems at the moment. Certainly our projects have not gone to the point where there would indeed be a patent problem.

One of the things that we are looking at, though, is some of the ancient traditional herbal medicines that, for example, may have anticancer effects. There is one such drug called Harringtonin which the Chinese claim has a very strong antitumor effect. They are using this drug and we are testing that here. Obviously, the drug belongs to the Chinese, but they are willing to let us use it. I suspect we can develop an agreement whereby we can manufacture it as well as the Chinese.

Our agreement at the moment states that when either party develops a patentable substance or entity in their country that they can exploit it in their own country. The problem is in determining rights for commercial sales to third countries. In this area we have agreed to have further discussion.

We have not had a problem yet, but your question indicates that we do need to have some discussion among ourselves with the Chinese in this area.

Mr. SIKORSKI. Also the patent issue and copyright issue are not peculiar to this issue. With the development of computerized information systems, industrialized countries have been able to share important health information resources of the National Health Library of Medicine throughout the world.

Information on toxicology of chemicals becomes invaluable when designing a new industrial process to protect workers in their environment.

What is the requirement to permit the Chinese the use of MEDLINE and their export control problems regarding the computer aspect of their service?

Dr. **Malone**. At present the Chinese have sent some library experts over to review our system to look at our cataloging process and computer systems. We supply some searches from MEDLINE, but they have not linked into it electronically because of a lack of computer hardware.

I would suspect that when the Chinese are ready to develop such a system that they will have to be subjected to export regulations. At the moment we have not had to deal with that.

We are cooperating with them now to the extent we can. We are training and providing literature searches, but that is the extent of our cooperation at the moment.

Mr. **Sikorski**. That is a future protocol?

Dr. **Malone**. Yes.

Mr. **Sikorski**. Minority counsel?

Mr. **Bosco**. Dr. Malone, looking at the potential trade opportunities that may exist in the health protocol, you indicate in your statement that the Chinese have expressed an interest in acquiring U.S.-produced supplies and equipment.

Has their specific interest been communicated to the private sector and the Commerce Department?

Dr. **Malone**. We have not directly made such a communication to the Department of Commerce.

What we have discovered is, when the Chinese come to this country, they have their own agenda and often make their own contacts. However, if there is a specific piece of equipment needed in conjunction with a specific research protocol, then we do make some suggestions.

This has occurred in the areas of the cardiovascular epidemiology studies where we want to study certain concentrations of lipids or cholesterol in Chinese subjects the same way as we are doing here. We suggested that the same instrumentation has to be bought and used in China as it is here.

So, this is exactly what has been done to look at cholesterol and triglycerides. The Chinese have bought an analyzer, an ABA-200 instrument produced by Abbott Laboratories. They also have purchased an AutoPacer instrument from the Aims Co. here in this country to perform analyses.

I suspect that as studies of this sort increase and we want comparative data, that we will refer the Chinese to the same types of instrumentation that we use. Otherwise comparisons of the data are sometimes more difficult.

But we have not made direct overtures to the Department of Commerce. This has been done among the scientists themselves.

Mr. **Bosco**. In the example that you have just given us, has there been any problem at all with our export control regulations and licensing of these sales to China?

Dr. **Malone**. So far, I know of no such problem with the arrangements we have been talking about.

Mr. Bosco. If so requested, would your people who have visited China be able to assemble a list of items or processes that the Chinese require at this time and may be able to purchase from the United States?

Dr. **Malone**. I am sure we could do that because, with each protocol, with each research activity there is generally some instrumentation needed by each project. We don't have a long list now, but that could be done.

Mr. Bosco. One final question, Dr. Malone, if I may.

Has there been any interest at all from the private sector, from the pharmaceutical industry, to participate directly with your Department in any of these health protcol activities?

Dr. **Malone**. At the moment I know of no interaction and interest beyond the types that I have just described earlier.

If we get to the point of developing, say, an anticancer drug that shows great promise, I would be very surprised if we did not have some interest expressed by private industry.

Mr. Bosco. Would this type of participation by the private sector be welcomed by your agency and how do you think the Chinese would react to this type of proposal?

Dr. **Malone**. Let me answer it this way.

At the National Institutes of Health we are just beginning to grapple with the problems connected with this sort of relationship, the nature of the participation, who owns the data, when the data shall be released and things of that sort.

We are developing some policies which have not yet come off the press. I would suspect we would have to look very closely at those same kinds of problems because they would obviously be escalated to another dimension at an international level. So, I can only say at this moment that we would have to give this very close scrutiny. It would have to be something that we agree to, that the Chinese agree to, and that would be in accord with whatever policies we establish. Obviously that would be under the watchful eye of the State Department and our current regulations.

Mr. Bosco. Thank you, Dr. Malone.

Mr. **Sikorski**. One final question.

You state both sides recognize the need for China to develop a technological infrastructure to enable state of the art research.

How can the activities under these protocols we have talked about today help achieve this?

Dr. **Malone**. Since the moment of normalization of relations with China, I believe one of the greatest needs that we have observed is that of developing a cadre of capable researchers in fields under consideration.

Already we see a large number of Chinese scientists being trained in this country. I think that number will escalate and as it does so, we will be able to join with them in larger and more research projects.

So, we see coming to fruition gradually the development of a cadre of research manpower. That is a priority requirement in this country as well as in China.

As we get more trained researchers, obviously we can engage in more research projects and in more and higher technology. I think that eventually, having looked at the aggressiveness and the intellect of the Chinese scientists, we will have developed a tremendous partner in research in just a few years.

I think all of the benefits of research will accrue there as has occurred in this country.

Mr. **Sikorski**. Again, thank you and the other panelists for assistance in the hearing this afternoon.

The next hearing of this Special Subcommittee on U.S. Trade with China will be on November 14 at 2 p.m. The room will be announced later.

It will deal with multilateral export controls and their effects on U.S. trade.

If there is nothing else, we are adjourned.

[Whereupon, at 4:45 p.m., the subcommittee adjourned.]

[The following was received for the record:]

APPENDIX

The text of the 1979 agreement and the various protocols and related annexes discussed in the subcommittee hearings are reproduced in this appendix.

AGREEMENT BETWEEN
THE GOVERNMENT OF THE UNITED STATES OF AMERICA
AND
THE GOVERNMENT OF THE PEOPLE'S REPUBLIC OF CHINA
ON COOPERATION IN SCIENCE AND TECHNOLOGY

The Government of the United States of America and the Government of the People's Republic of China (hereinafter referred to as the Contracting Parties);

Acting in the spirit of the Joint Communique on the Establishment of Diplomatic Relations between the United States of America and the People's Republic of China;

Recognizing that cooperation in the fields of science and technology can promote the well-being and prosperity of both countries;

Affirming that such cooperation can strengthen friendly relations between both countries;

Wishing to establish closer and more regular cooperation between scientific and technical entities and personnel in both countries;

Have agreed as follows:

ARTICLE 1

1. The Contracting Parties shall develop cooperation under this Agreement on the basis of equality, reciprocity and mutual benefit.

2. The principal objective of this Agreement is to provide broad opportunities for cooperation in scientific and technological fields of mutual interest, thereby promoting the progress of science and technology for the benefit of both countries and of mankind.

ARTICLE 2

Cooperation under this Agreement may be undertaken in the fields of agriculture, energy, space, health, environment, earth sciences, engineering, and such other areas of science and technology and their management as may be mutually agreed, as well as educational and scholarly exchange.

ARTICLE 3

Cooperation under this Agreement may include:

a. Exchange of scientists, scholars, specialists and students;

b. Exchange of scientific, scholarly, and technological information and documentation;

c. Joint planning and implementation of programs and projects;

d. Joint research, development and testing, and exchange of research results and experience between cooperating entities;

e. Organization of joint courses, conferences and symposia;

f. Other forms of scientific and technological cooperation as may be mutually agreed.

ARTICLE 4

Pursuant to the objectives of this Agreement, the Contracting Parties shall encourage and facilitate, as appropriate, the development of contacts and cooperation between government agencies, universities, organizations, institutions, and other entities of both countries, and the conclusion of accords between such bodies for the conduct of cooperative activities. Both sides will further promote, consistent with such cooperation and where appropriate, mutually beneficial bilateral economic activities.

ARTICLE 5

Specific accords implementing this Agreement may cover the subjects of cooperation, procedures to be followed, treatment of intellectual property, funding and other appropriate matters. With respect to funding, costs shall be borne as mutually agreed. All cooperative activities under this Agreement shall be subject to the availability of funds.

ARTICLE 6

Cooperative activities under this Agreement shall be subject to the laws and regulations in each country.

ARTICLE 7

Each Contracting Party shall, with respect to cooperative activities under this Agreement, use its best efforts to facilitate prompt entry into and exit from its territory of equipment and personnel of the other side, and also to provide access to relevant geographic areas, institutions, data and materials.

ARTICLE 8

Scientific and technological information derived from cooperative activities under this Agreement may be made available, unless otherwise agreed in an implementing accord under Article 5, to the world scientific community through customary channels and in accordance with the normal procedures of the participating entities.

ARTICLE 9

Scientists, technical experts, and entities of third countries or international organizations may be invited, upon mutual consent of both sides, to participate in projects and programs being carried out under this Agreement.

ARTICLE 10

1. The Contracting Parties shall establish a US-PRC Joint Commission on Scientific and Technological Cooperation, which shall consist of United States and Chinese parts. Each Contracting Party shall designate a co-chairman and its members of the Commission. The Commission shall adopt procedures for its operation, and shall ordinarily meet once a year in the United States and the People's Republic of China alternately.

2. The Joint Commission shall plan and coordinate cooperation in science and technology, and monitor and facilitate such cooperation. The Commission shall also consider proposals for the further development of cooperative activities in specific areas and recommend measures and programs to both sides.

3. To carry out its functions, the Commission may when necessary create temporary or permanent joint subcommittees or working groups.

4. During the period between meetings of the Commission, additions or amendments may be made to already approved cooperative activities, as may be mutually agreed.

5. To assist the Joint Commission, each Contracting Party shall designate an Executive Agent. The Executive Agent on the United States side shall be the Office of Science and Technology Policy; and on the side of the People's Republic of China, the State Scientific and Technological Commission. The Executive Agents shall collaborate closely to promote proper implementation of all activities and programs. The Executive Agent of each Contracting Party shall be responsible for coordinating the implementation of its side of such activities and programs.

ARTICLE 11

1. This Agreement shall enter into force upon signature and shall remain in force for five years. It may be modified or extended by mutual agreement of the Parties.

2. The termination of this Agreement shall not affect the validity or duration of any implementing accords made under it.

DONE at Washington this 31st day of January, 1979, in duplicate in the English and Chinese languages, both equally authentic.

FOR THE GOVERNMENT OF THE UNITED STATES OF AMERICA:	FOR THE GOVERNMENT OF THE PEOPLE'S REPUBLIC OF CHINA:
Jimmy Carter	

PROTOCOL BETWEEN
THE GOVERNMENT OF THE UNITED STATES OF AMERICA
AND
THE GOVERNMENT OF THE PEOPLE'S REPUBLIC OF CHINA
ON COOPERATION IN HYDROELECTRIC POWER
AND
RELATED WATER RESOURCE MANAGEMENT

The Government of the United States of America and the Government of the People's Republic of China (hereinafter referred to as the Parties), pursuant and subject to the Agreement between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology, signed in Washington, D.C. on January 31, 1979, for the purpose of establishing and promoting cooperation in the field of hydroelectric power and related water resource management, have agreed as follows:

ARTICLE 1

The Parties agree to establish and promote cooperation in the field of hydroelectric power generation and related water resource management on the basis of equality, reciprocity and mutual benefit.

ARTICLE 2

The Parties shall encourage and facilitate the development of contacts and cooperation between government agencies, universities, industrial organizations and other entities, and private individuals, and the conclusion of appropriate arrangements for the conduct of specific activities.

ARTICLE 3

The Parties agree that cooperation under this Protocol may include the following forms:

(1) Exchange and provision of information of mutual interest on scientific and technical developments, activities and practices;

(2) Research and development activities in the form of experiments, tests, studies, analyses, and other technical collaborative activities;

(3) Exchange, or assignment by one Party, of scientists, engineers, other specialists and personnel for training purposes to the facilities of the other Party for visit and study;

(4) Exchange and provision of samples, materials, instruments, equipment and components for testing and evaluation;

(5) Agreements for the provision of specific services, such as planning and project design, consultation on specific technical problems and construction management;

(6) Such other forms of cooperation as are mutually agreed, for example, cooperation in acquisition of equipment and materials.

ARTICLE 4

Specific undertakings, obligations and conditions with respect to the conduct of each activity under Article 3, including responsibility for the payment of expenses, shall be agreed by authorized entities of the Parties on a case-by-case basis. For the United States of America the authorized entities (hereinafter referred to as the Participating Agencies) shall include the Department of Energy, the Bureau of Reclamation of the Department of the Interior, the Corps of Engineers, and the Tennessee Valley Authority. For the People's Republic of China the Participating Agencies shall include the Ministry of Electric Power and the Ministry of Water Conservancy.

ARTICLE 5

(1) For the purpose of promoting proper conduct of activities of the Participating Agencies pursuant to this Protocol, each Party will designate a national coordinator.

(2) The coordinators of the Parties each year shall develop a listing of joint activities. They shall be responsible for coordinating and arranging, as necessary, the implementation of activities of the respective sides.

(3) Each Party shall designate its national coordinator within two months of the effective date of this Protocol. The coordinators or their deputies shall meet as mutually agreed, alternately in the United States of America and in the People's Republic of China.

ARTICLE 6

(1) This Protocol shall enter into force upon signature and shall remain in force for a five-year period. It may be amended or extended by mutual agreement of the Parties.

(2) The termination of this Protocol shall not affect the validity or duration of project agreements entered into hereunder.

Done at Beijing this 28th day of August, 1979, in duplicate in the English and Chinese languages, both equally authentic.

FOR THE GOVERNMENT OF THE UNITED STATES OF AMERICA	FOR THE GOVERNMENT OF THE PEOPLE'S REPUBLIC OF CHINA
Walter F Mondale	

ANNEX I

TO THE PROTOCOL BETWEEN THE GOVERNMENT OF THE UNITED STATES OF AMERICA AND THE GOVERMENT OF THE PEOPLE'S REPUBLIC OF CHINA ON COOPERATION IN HYDROELECTRIC POWER AND RELATED WATER RESOURCE MANAGEMENT

The American Hydropower Delegation led by Mr. S. David Freeman, Chairman of the Tennessee Valley Authority, which visited the People's Republic of China (PRC) from March 1-17, 1980, held discussions with the Chinese Hydropower Delegation on possible areas of cooperation during 1980-1981 in line with the Protocol. In addition, the Parties also exchanged views on projects to be built.

The Parties reached specific agreement as follows:

1. Cooperative activities on hydroelectric power and related water resource management of the Hongshui River in China:

1.1 The American side will send a delegation of ten specialists to China for one month in August 1980 to study the Hongshui River and to discuss the multi-purpose development program, and Datengxia and Longtan hydroelectric power projects which will be built in the near future.

1.2 The Chinese side will dispatch a mission of ten specialists to the United States in September-October 1980 to study for one month the multi-purpose development planning of the Columbia River, estuary regulation and large scale hydroelectric power projects in the Columbia valley and the adjoining area.

1.3 Based on these mutual visits, the Parties will further discuss the alternatives of multi-purpose development planning of the Hongshui River and will decide on cooperative activities concerning multi-purpose development technology for the Datengxia and Longtan hydroelectric power projects.

2. Cooperative activities on the Longtan hydroelectric power project in China:

2.1 As requested by the PRC Ministry of Electric Power, the U. S. Army Corps of Engineers will send ten to fifteen specialists to China for variable periods, depending on need, over a six month period beginning in July 1980 for the purpose of studying the economic feasibility of, and reviewing the engineering design and construction planning for the Longtan project.

2.1.1 If the above study by the U. S. specialists discloses the need for further work and the Ministry of Electric Power desires further assistance, the details of such assistance will be negotiated separately between the Ministry of Electric Power and the Corps of Engineers.

2.1.2 During the construction phase of the Longtan project, the Corps of Engineers will provide on-site assistance in construction engineering and management if desired by the Ministry of Electric Power. The details of such construction assistance will be negotiated separately between the Ministry of Electric Power and the Corps of Engineers six months prior to the beginning of construction.

2.2 As requested by the Corps of Engineers, the Ministry of Electric Power will send six to ten specialists to the United States for a period of six to twelve months to be assigned to various U. S. locations for the purpose of participating in specific engineering planning, design and construction work. This exchange will begin after October 1, 1980.

3. Cooperative activities on multi-purpose development technology of the Three-Gorge project in China:

3.1 The American side will dispatch a delegation of ten specialists to China in September 1980 for one and a half months to study the dam sites of the Three-Gorge project and to discuss the planning and design alternatives of the Three-Gorge project and designs of high dams, large scale power houses, gates, steel pipe, opening and closing mechanisms, large high head navigation structures, large size diversion works and extra high voltage AC and DC transmission technology as well as the selection of large size water turbine generating sets.

3.2 The Chinese side will send a delegation of ten specialists to the United States in May 1980 for one month to study the multi-purpose utilization of the Tennessee and Colorado Rivers and operational control of river systems and hydroelectric power stations in cascades and to make a study tour of the Engineering and Research Center of the Water and Power Resources Service of the U. S. Department of Interior and the Waterways Experiment Station of the U. S. Army Corps of Engineers as well as inter-valley diversion in the western arid areas of the United States.

3.3 Based on these mutual visits, the Parties will discuss and define scientific and technical cooperation in the field of multi-purpose utilization of water resources and the Three-Gorge project and will explore the design alternatives of the Three-Gorge project.

4. As requested by the PRC Ministry of Electric Power, the Bonneville Power Administration of the U. S. Department of Energy will receive a team of seven Chinese specialists in the United States for one month in November-December 1980 to study power grid technology and related modern test and experiment methods. The Ministry of Electric Power and the Bonneville Power Administration will discuss further and decide on additional scientific and technical areas for cooperation in the development of transmission alternatives.

5. Cooperative activities on the Ertan hydroelectric power project in China:

5.1 As requested by the PRC Ministry of Electric Power, the U.S. Water and Power Resources Service will send a team of five specialists to China for three months from August to October 1980 to study jointly with Chinese specialists the design alternatives for the Ertan hydroelectric power project, including navigation feasiblity, and to make a study tour to the dam site.

5.1.1 If the above joint study discloses the need for further work and the Ministry of Electric Power desires further assistance, the details of such assistance will be negotiated separately between the Ministry of Electric Power and the Water and Power Resources Service.

5.1.2 During the construction phase of the Ertan project, the Water and Power Resources Service will provide on-site assistance in construction engineering and management if desired by the Ministry of Electric Power. The details of such construction assistance will be negotiated separately between the Ministry of Electric Power and the Water and Power Resources Service six months prior to the beginning of construction.

5.2 As requested by the Water and Power Resources Service, the Ministry of Electric Power will send five specialists to the United States for one month to visit the Engineering and Research Center of the Water and Power Resources Service and other facilities of relevance to this project.

5.3 The Ministry of Electric Power and the Water and Power Resources Service will hold further discussions after these visits and may decide on further cooperation on the comprehensive development of the Ertan project and related scientific and technical research.

6. Scientific cooperation on the regulation of the Changjiang River Estuary in China:

6.1 As requested by the PRC Ministry of Communications, the U. S. Army Corps of Engineers will send a team of six to eight specialists to China for one month after July 1980 to make a study (including surveys, research, design and construction) of the estuary of the Changjiang River and to review the regulation problem (including sedimentation) with Chinese specialists experienced in the functioning of the Changjiang River and its estuary.

6.2 As requested by the Corps of Engineers, the Ministry of Communications will send a team of six to eight specialists to the United States in October 1980 for one month to visit and study the Mississippi and other similar estuaries in the United States and also the experimental centers involved in estuary research.

6.3 If the above study discloses the need for further work and the Ministry of Communications desires further assistance, the details of such assistance will be negotiated separately between the Ministry of Communications and the Corps of Engineers.

7. The number of specialists and the dates and duration of visits under this Annex are understood to be approximations, subject to case by case resolution, according to the needs of the project and the availability of funds and personnel. Details regarding specific personnel, expenses and living conditions will also be resolved on a case by case basis.

8. In order to make the above exchange visits as productive as possible, each side agrees to supply the other with pertinent technical information regarding the subject of the visits at least one month prior thereto.

9. . The Chinese side will dispatch to the United States in 1980-1981 fifty specialists in hydroelectric power, transmission and transformation, water conservancy, navigation and other related fields to gain practical experience in corresponding U.S. governmental departments and research institutions. The stay in the United States for most Chinese specialists will be six to twelve months.

10. The U. S. side noted that the Chinese side has had experience in hydroelectric power and water resource management which is of interest to the United States. The Parties agree to exchange information regarding these areas and to visits by U.S. specialists to study the Chinese experience.

11. The Parties recognize that there may be a need for subsequent consultations on additional activities as well as on modifications of those activities specified in this Annex. Where such related activities are identified, it is understood that new items under this Annex will be added by mutual consent.

12. The cooperative activities carried out under this Annex will be subject to the funds and manpower available to the Parties. The specific missions, obligations and conditions with respect to the above-mentioned activities, including the responsibility for the payment of costs, shall be decided upon by mutual agreement on a case by case basis. For the purpose of implementing the cooperative activities of this Annex, the sources of the funds shall be sought in accordance with the relevant laws and regulations of the Parties.

Done at Beijing this 15th day of March, 1980, in duplicate in the English and Chinese languages, both equally authentic.

CHAIRMAN OF THE AMERICAN HYDROPOWER DELEGATION	CHAIRMAN OF THE CHINESE HYDROPOWER DELEGATION
S. David Freeman	
THE AMERICAN NATIONAL COORDINATOR	THE CHINESE NATIONAL COORDINATOR

ANNEX II

To the Protocol between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Hydroelectric Power and Related Water Resource Management.

The U.S. National Coordinator Eugene K. Lawson held discussions with the Chinese National Coordinator Zhu Jinyde on possible areas of further cooperation during 1982-84 under the Protocol September 16-20, 1982, in Washington, D.C. The parties reached specific agreement as follows:

1. Continuation of implementation of uncompleted activities under Annex I (paragraphs 2.2 and 9 of Annex I):

1.1 As provided in paragraph 9 of Annex I, the Chinese side will send to the United States fifty specialists in hydroelectric power, transmission and transformation, water conservancy, navigation and other related fields to gain practical experience, as appropriate, in corresponding U.S. Government agencies, research institutions and private companies. The stay in the United States for most Chinese specialists will be six to twelve months.

1.2 The Chinese side will provide the U.S. side as soon as possible a list of Chinese specialists to be placed in the U.S. under paragraph 9 of Annex I. The list should include information on the educational background and work experience of the specialists, their primary areas of interest, the nature of the training in which they are interested and the nature of the projects that each specialist will be assigned to upon return to China. Specialists should be fluent in the English language and properly qualified for their assignments.

2. Cooperative activities on the Tianshengqiao hydropower project (THP):

2.1 The U.S. Trade and Development Program (TDP) will provide a grant of four hundred thousand U.S. dollars ($400,000) to the Ministry of Water Resources and Electric Power for obtaining professional and technical services performed by a U.S. firm in preparing a technical alternatives study for optimum construction methods for two tunnels for the low dam, providing guidance for preparation of tender documents for the low dam to meet World Bank standards and in carrying out preliminary conceptual design studies for several technical aspects of the high dam. The U.S.-PRC Grant Agreement for the Tianshengqiao Hydropower Project, signed on June 10, 1982, which covers these activities, forms an integral part of the Annex.

2.2 It is expected that further cooperative activities on THP will be carried out under this Annex. The details of such activities will be negotiated separately between the Ministry of Water Resources and Electric Power and the U.S. side, including TDP.

3. Cooperative activities on the Longtan and other Hongshui River Basin hydropower projects in China:

3.1 As requested by the PRC Ministry of Water Resources and Electric Power, the U.S. side will send approximately four specialists to China for eight weeks in the fourth quarter of 1983 for the purpose of a joint study with Chinese specialists of the general layout, selection of dam type, associated transmission facilities, the possibility of getting the units into service in advance by staged or non-staged construction and construction engineering and management of the Longtan project. The specialists will include, as appropriate, representatives of the U.S. Army Corps of Engineers and U.S. private companies.

3.1.1 If the above study by the U.S. specialists discloses the need for further work and the Ministry of Water Resources and Electric Power desires further assistance on the Longtan or other Hongshui River Basin hydropower projects, the details of such assistance will be negotiated separately between the Ministry of Water Resources and Electric Power and the U.S. side.

3.2 During the construction phase of the Longtan and other Hongshui River Basin hydropower projects, the U.S. side will provide on-site assistance in construction engineering and management if desired by the Ministry of Water Resources and Electric Power. The details of such construction assistance will be negotiated separately between the Ministry of Water Resources and Electric Power and the U.S. side prior to the beginning of construction.

4. Cooperative activities on multi-purpose development technology of the Three Gorges project in China:

4.1 The Chinese side will send a team of seven to ten specialists to the United States in the third quarter of 1983 for one month to study relevant hydropower facilities and engineering research institutions and to discuss with their American colleagues the specific subjects of the Three Gorges project, such as development plan in stages, general layout, design of hydraulic structures, selection of units, construction sequence, associated transmission facilities and benefits of power generation.

4.2 As requested by the Chinese side, the U.S. side will send a team of seven to eight specialists to China in the first half of 1984 for six weeks to provide assistance in the technical aspects described in paragraph 4.1. The U.S. specialists will include, as appropriate, representatives of the Bureau of Reclamation and U.S. private companies.

4.3 If the above activities disclose the need for further work and the Ministry of Water Resources and Electric Power desires further assistance, the details of such assistance will be negotiated separately between the Ministry of Water Resources and Electric Power and the U.S. side.

4.4 During the construction phase of the Three Gorges project, the U.S. side will provide on-site assistance in construction engineering and management if desired by the Ministry of Water Resources and Electric Power. The details of such construction assistance will be negotiated separately between the Ministry of Water Resources and Electric Power and the U.S. side prior to the beginning of construction.

5. Cooperative activities on the Ertan hydropower project (EHP) in China:

5.1 As requested by the Chinese side, the U.S. side will send a team of six specialists to China in the fourth quarter of 1982 for one month to study and discuss with Chinese specialists the following technical aspects of EHP: seismic design, high velocity flow and hydraulic model tests, rock mechanics, stability of dam abutment, stress analysis on dam body, foundation treatment, generating units and gates, associated distribution facilities and construction engineering and management. The specialists will include, as appropriate, representatives of the Bureau of Reclamation and U.S. private companies.

5.1.1 If the above joint study discloses the need for further work and the Ministry of Water Resources and Electric Power desires further assistance, the details of such assistance will be negotiated separately between the Ministry of Water Resources and Electric Power and the U.S. side.

5.1.2 During the construction phase of the Ertan hydropower project, the U.S. side will provide on-site assistance in construction engineering and management if desired by the Ministry of Water Resources and Electric Power. The details of such construction assistance will be negotiated separately between the Ministry of Water Resources and Electric Power and the U.S. side prior to the beginning of construction.

5.2 The Chinese side will send a specialist team of six to the United States in the fourth quarter of 1983 for one month to study the design and construction technologies of high arched dams and underground works.

6. U.S.-Chinese hydropower development seminars:

6.1 Beginning in the second quarter of 1983, the U.S. side and the Chinese side will jointly sponsor a series of hydropower development technical seminars which will be held once a year in the U.S. or the People's Republic of China. The details of such seminars will be negotiated separately between the two sides. It is understood that the first seminar will be hosted by the Tennessee Valley Authority and will focus on multi-purpose river basin development and planning.

6.2 The U.S. Department of Commerce will organize a Technical Seminar on hydropower engineering and equipment which will be sponsored by the Ministry of Water Resources and Electric Power. The seminar will take place in China during May 1983.

6.3 The U.S. side will organize a seminar on methods of financing hydroelectric power projects. The seminar will take place in China during the second half of 1983.

7. Upon request, the U.S. side will, under appropriate financial arrangements (possibly including reimbursable funding), advise on and review PRC multipurpose river basin development including, but not limited to, hydroelectric power, irrigation, estuary regulation, electric power transmission, environmental factors, navigation, flood control, ports and harbors and related water resource development. The U.S. side will arrange for technical assistance to the Chinese side in the following areas of multipurpose river system development:

a. Conceptual master planning
b. Feasibility studies (technical, economic and financial)
c. Engineering design/tender documents
d. Project management, including construction planning and management
e. Maintenance and operation
f. Project-oriented training

8. The number of specialists and the dates and duration of visits under this Annex are understood to be approximations, subject to case-by-case resolution, according to the needs of the project and subject to the availability of funds and personnel. However, the intent of the parties is that the following funding pattern be followed:

For activities connected with 6.2, the U.S side will pay all expenses.

For activities connected with 2.1, the U.S. side (TDP) will pay expenses in accordance with the U.S.-PRC Grant Agreement for the Tianshengqiao Hydropower Project.

For activities connected with paragraph 9 of Annex I, the Chinese side will have the responsibility to arrange funding. The U.S. side will assist the Chinese side in attempting to arrange funding and support from other sources, including U.S. private companies. In any case, the U.S. side will not charge any training fees for activities under paragraph 9 of Annex I.

For activities connected with 4.1, the U.S. side will pay local costs in the U.S., while the Chinese side will pay international travel expenses.

For activities connected with 3.1, 4.2, 5.1 and 6.3, the Chinese side will pay local costs in China, while the U.S. side will pay international travel expenses.

For activities connected with 2.2, 3.1.1, 3.2, 4.3, 4.4, 5.1.1, 5.1.2, 5.2, 6.1 and 7, payment shall be decided upon through friendly discussions between the two sides.

The source of funds shall be sought in accordance with the relevant laws and regulations of the parties. For most cooperative activities under this Annex, it is understood that both U.S. Government and private sector specialists should participate. The composition of U.S. delegations to China under paragraphs 3.1, 4.2, 5.1 and 6.3 will be agreed to by the National Coordinators after consultation between U.S. Government agencies and private companies. It is expected that each delegation will be headed by a U.S. Government official. Similarly, the specific agenda and itinerary for each visit by a U.S. delegation to China or a Chinese delegation to the U.S. will be agreed upon by the National Coordinators. After agreement is reached, however, details and planning may be carried out through direct communication between the Chinese and U.S. Government agencies involved.

Done at Washington, D.C. this 20th day of September, 1982, in duplicate in the English and Chinese languages, both equally authentic.

The U.S. National Coordinator

Eugene K. Lawson

The Chinese National Coordinator

Zhu Jingde

PROTOCOL BETWEEN

THE DEPARTMENT OF COMMERCE
OF THE UNITED STATES OF AMERICA

AND

THE STATE SCIENTIFIC AND TECHNOLOGICAL COMMISSION
OF THE PEOPLE'S REPUBLIC OF CHINA

ON COOPERATION IN THE FIELDS OF MANAGEMENT OF SCIENCE AND TECHNOLOGY AND SCIENTIFIC AND TECHNICAL INFORMATION

The Department of Commerce of the United States of America and the State Scientific and Technological Commission of the People's Republic of China (hereinafter referred to as the Parties), in accordance with and subject to the Agreement Between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology, signed in Washington, D. C. on January 31, 1979, for the purpose of promoting cooperation and collaboration in the fields of management of science and technology, and scientific and technical information have agreed as follows:

ARTICLE 1

The Parties agree to establish this framework for cooperation and collaboration in the fields of management of industrial science and technology and scientific and technical information.

The Parties agree to conduct exchanges and collaborative activities on the basis of equality, reciprocity and mutual benefit.

ARTICLE 2

Cooperation under Article 1 of this Protocol in the field of management of industrial science and technology may include the following forms:

(1) Exchange and provision of publications and literature on the management of industrial science and technology;

(2) Exchange of specialists and scholars in the management of industrial science and technology for lecturing purposes;

(3) Exchange of personnel in the management of industrial science and technology for training purposes;

(4) Joint organization of conferences, symposia, and courses;

(5) Such other forms of cooperation as are mutually agreed.

ARTICLE 3

Cooperation under Article 1 of this Protocol in the field of scientific and technical information may include the following forms:

(1) Exchange and provision of various kinds of available scientific and technical information;

(2) The facilitation of utilization of available information systems and data bases;

(3) Cooperation for the development and refinement of such data bases and information systems;

(4) Exchange of personnel for training purposes;

(5) Such other forms of cooperation as are mutually agreed.

The application or use of any information exchanged or transferred between the Parties under this Article shall be the responsibility of the Party receiving it, and the transmitting Party does not warrant the suitability of such information for any particular use or application.

ARTICLE 4

The specific tasks, obligations, and conditions with respect to each activity under this Protocol, including responsibility for the payment of costs, shall be decided by mutual agreement, on a case-by-case basis.

ARTICLE 5

In order to coordinate the related activities under this Protocol, each Party shall designate a representative to be responsible for determining the particular directions of cooperation and for ensuring the effectiveness of the exchanges. The representatives of the Parties or their designated coordinators will, by correspondence, consult with each other and define the cooperative activities and other related matters. When necessary, a meeting may be convened by mutual agreement, to consider matters related to the implementation of this Protocol. The representatives shall be named by the Parties within thirty (30) days of the effective date of this Protocol.

ARTICLE 6

Specific arrangements related to the cooperation as mutually agreed upon are embodied in Annex 1 to this Protocol. New cooperative programs will be agreed upon by correspondence between the representatives of the Parties, and such new agreements will be attached as annexes to this Protocol.

ARTICLE 7

All activities under this Protocol shall be conducted under the guidance of the US/PRC Joint Commission on Scientific and Technological Cooperation.

All questions related to this Protocol or activities carried out hereunder, unless settled by mutual agreement of the Parties, shall be referred to the above mentioned Joint Commission.

ARTICLE 8

(1) This Protocol shall enter into force upon signature, and shall remain in force for a five-year period. It may be amended or extended by mutual agreement of the Parties.

(2) The termination of this Protocol shall not affect the validity or duration of specific activities being undertaken hereunder.

Done at Beijing this 8th day of May, 1979, in duplicate in the English and Chinese languages, both equally authentic.

FOR THE DEPARTMENT OF COMMERCE OF THE UNITED STATES OF AMERICA	FOR THE STATE SCIENTIFIC AND TECHNOLOGICAL COMMISSION OF THE PEOPLE'S REPUBLIC OF CHINA
Juanita M. Kreps	
JUANITA M. KREPS	FANG YI

A true copy of the signed original. [illegible]

ANNEX 1

TO THE
PROTOCOL BETWEEN

THE DEPARTMENT OF COMMERCE
OF THE UNITED STATES OF AMERICA

AND

THE STATE SCIENTIFIC AND TECHNOLOGICAL COMMISSION
OF THE PEOPLE'S REPUBLIC OF CHINA

ON COOPERATION IN THE FIELDS OF MANAGEMENT OF SCIENCE AND TECHNOLOGY AND SCIENTIFIC AND TECHNICAL INFORMATION

In accordance with the Protocol between the Department of Commerce of the United States of America and the State Scientific and Technological Commission of the People's Republic of China on Cooperation in the Fields of Management of Science and Technology and Scientific and Technical Information, signed in Beijing, on May 8th, 1979, the Parties have agreed to conduct the activities set forth in Annex 1.

The activities described in Annex 1 have been agreed upon in principle, but the details for the arrangements for implementing these activities, including scheduling and payment of costs, must be made final by the coordinators before final commitments can be undertaken. The Parties agree that as soon as the coordinators are designated they will immediately begin work to make final arrangements.

I. Delegations of experts will be exchanged between the Parties. Dr. Jordan Baruch, Assistant Secretary for Science and Technology of the U. S. Department of Commerce will lead a delegation comprised of experts in the area of industrial science and technology management to visit the People's Republic of China at a mutually agreed time. The Chinese delegation of experts will pay a reciprocal visit to the U. S. at an appropriate time.

II. Two to three experts from the U. S. in the area of management of industrial science and technology will deliver lectures in China in 1980 over a one to two month period. Primary emphasis of the lectures will be upon such subjects as the following: making industrial science and technology policy; shaping long-term and short-term plans for industrial science and technology development; determining the priorities for industrial research and development programs and their interrelations; evaluating and reviewing accomplishments in industrial science and technology; and, forecasting development of industrial science and technology, etc.

III. A symposium, participated in by about ten experts from each Party, will be held in China during 1980 to discuss related topics on the theory and practice of systems engineering and its economic impacts.

IV. Two Chinese working groups, each consisting of not more than five administrators of industrial science and technology management, will pay a study trip in 1980 to appropriate research institutions and enterprises, etc. of the United States to learn about the experiences of the whole process from basic research to industrial production for one to two months.

V. Five Chinese lecturers or higher in the fields of the management of industrial science and technology and systems engineering and its economic impacts will visit in 1980 appropriate institutions of the United States to work or for advanced study.

VI. The Institute of Scientific and Technical Information of China (ISTIC) and the National Technical Information Service (NTIS) establish relations in direct provision of scientific and technical information.

From the beginning of 1980, NTIS will furnish ISTIC with two current subscriptions to its comprehensive journal Government Reports Announcements and Index (GRA&I). All of the technical reports announced in GRA&I as available from NTIS, approximately 70,000 new technical reports each year, will be available to the ISTIC at U. S. domestic prices, which represents a 50 percent reduction from prices normally charged by NTIS to all foreign buyers. The ISTIC will select and order individual NTIS reports or categories of NTIS reports by originating agencies and subjects.

ISTIC will provide NTIS with lists of available journals and other information. ISTIC will provide to NTIS those selected at favoured prices.

VII. ISTIC will send in 1980 four Chinese technicians specialized in scientific and technical information to NTIS and other appropriate institutions for training in their scientific and technical information activities for one to two months.

VIII. NTIS will work with ISTIC to determine the most appropriate method for ISTIC to obtain the full bibliographic citations contained in the NTIS data bases.

NTIS will then assist the ISTIC in making the necessary arrangements.

Annex 1 shall enter into force upon the signing by the Parties of the above referenced Protocol on Cooperation in the Fields of Management of Science and Technology and Scientific and Technical Information.

ANNEX II

TO THE PROTOCOL BETWEEN THE DEPARTMENT OF COMMERCE OF THE UNITED STATES OF AMERICA AND THE STATE SCIENTIFIC AND TECHNOLOGICAL COMMISSION OF THE PEOPLE'S REPUBLIC OF CHINA ON COOPERATION IN THE FIELDS OF MANAGEMENT OF SCIENCE AND TECHNOLOGY AND SCIENTIFIC AND TECHNICAL INFORMATION

From February 8, 1982
to February 19, 1982
1982, Representatives of the Department of Commerce of the United States of America and the Delegation of Scientific and Technical Cooperation from the State Scientific and Technological Commission of the People's Republic of China (hereinafter referred to as the Parties) discussed cooperative projects of mutual interest in management of science and technology and have agreed to carry out the activities set forth in Annex II.

The activities listed in Annex II have been agreed upon in principle, but detailed arrangements for implementing these activities, including scheduling and payment of costs, will be made final in writing through consultation between the coordinators of the Parties.

I. The US Department of Commerce will send a delegation (of about 10) to visit China for two to three weeks at an appropriate time agreed upon by the Parties. The PRC State Scientific and Technological Commission will be responsible for the reception of the delegation. The delegation will study China's scientific and technological development and hold discussions on potential new activities for bilateral cooperation.

II. In 1982 and 1983, joint symposia on management of science and technology will be conducted separately in the USA and the PRC. Ten experts and specialists from each Party will participate in each symposium to discuss topics relating to theory and practice of management of science and technology.

III. The PRC will dispatch a group (of about 5) to study the entire process from basic research to industrial production at appropriate US organizations for a period of 1-2 months in 1982.

IV. Ten Chinese specialists in the fields of program formulation, project examination, and management of large-scale scientific and technical projects will be selected and the US Department of Commerce will assist in placing them in appropriate US organizations for work and investigation for periods of 3-6 months in 1982.

This Annex shall enter into force upon signing of the document in Washington this first day of March, 1982, in duplicate in the English and Chinese languages, both equally authentic.

FOR THE DEPARTMENT OF COMMERCE OF THE UNITED STATES OF AMERICA	FOR THE STATE SCIENTIFIC AND TECHNOLOGICAL COMMISSION OF THE PEOPLE'S REPUBLIC OF CHINA
Eugene K. Lawson	杨纪珂

ANNEX III
TO THE
PROTOCOL BETWEEN
THE DEPARTMENT OF COMMERCE
OF THE UNITED STATES OF AMERICA
AND
THE STATE SCIENTIFIC AND TECHNOLOGICAL COMMISSION
OF THE PEOPLE'S REPUBLIC OF CHINA
ON COOPERATION IN THE FIELDS OF
MANAGEMENT OF SCIENCE AND TECHNOLOGY
AND SCIENTIFIC AND TECHNICAL INFORMATION

From February 8, 1982
to February 19, 1982
1982, Representatives of the Department of Commerce of the United States of America and the Delegation of Scientific and Technical Cooperation from the State Scientific and Technological Commission of the People's Republic of China (hereinafter referred to as the Parties) discussed cooperative projects of mutual interest in scientific and technical information and have agreed to carry out the activities set forth in Annex III.

The activities listed in Annex III have been agreed upon in principle, but detailed arrangements for implementing these activities, including scheduling and payment of costs, will be made final in writing through consultation between the coordinators of the Parties.

I. The National Technical Information Service of the United States (NTIS) and the Institute for Scientific and Technical Information of China (ISTIC) agree to have communication between managers of the two organizations at appropriate times to review and implement the cooperative activities herein agreed upon and other cooperative projects agreed upon afterwards. This communication should include reciprocal personnel visits, correspondence, and participation in national and regional information activities.

II. NTIS and ISTIC will continue to provide scientific and technical information from their respective institutions at favored prices as prescribed in Article VI of Annex I to the Protocol on Cooperation in the fields of Management of Science and Technology and Scientific and Technical Information signed by the Parties in 1979.

III. NTIS and ISTIC will initiate a joint work-study program at NTIS. At the invitation of NTIS, two Chinese specialists in scientific and technical information will arrive in the United States to begin the program in December 1981 and the other two participants will be invited in May 1982.

A. The objective of the program is to enable the Chinese personnel to obtain advanced executive training on scientific and technical information and increase the exchange of information between the two organizations.

B. Scope of the Work-Study Program

NTIS will facilitate for four (4) Chinese information scientists to be assigned to NTIS operating units for work-study activities; make arrangements for their participation in the NTIS Information Systems Workshop; provide access to facilities required in carrying out the program; provide basic living expenses, hospital and accident insurance for the four Chinese scientists, and assist in arrangements for lodging throughout the period of assignment in the United States.

ISTIC will assign in December 1981 two technicians and in May 1982 the other two persons for work-study in the following areas:

-Abstracting, indexing and bibliographic searching

-Acquisition, evaluation, packaging and dissemination of "appropriate technology"

-Computer processing and data base management

-Selection and acquisition of technical information from foreign sources other than US.

The Chinese technicians selected should have the equivalent of a university degree, practical experience, and English proficiency.

IV. The Chinese side will provide translation services to NTIS through the China Scientific and Technical Documentation Translation Company. Both sides agree to perform these services initially on a pilot project basis for Chinese and Japanese to English translation of information. Depending on the progress of this pilot project, a long term contract may be considered by both sides.

This Annex shall enter into force upon signing of the document in Washington this first day of March , 1982, in duplicate in the English and Chinese languages, both equally authentic.

Joseph F. Caponio
FOR THE NATIONAL TECHNICAL
INFORMATION SERVICE OF
THE UNITED STATES

徐间
FOR THE INSTITUTE FOR
SCIENTIFIC AND TECHNICAL
INFORMATION OF CHINA

ANNEX IV

TO THE PROTOCOL BETWEEN THE DEPARTMENT OF COMMERCE OF THE UNITED STATES OF AMERICA AND THE STATE SCIENTIFIC AND TECHNOLOGICAL COMMISSION OF THE PEOPLE'S REPUBLIC OF CHINA ON COOPERATION IN THE FIELDS OF MANAGEMENT OF SCIENCE AND TECHNOLOGY AND SCIENTIFIC AND TECHNICAL INFORMATION

From February 8, 1982
to February 19, 1982
1982, Representatives of the Department of Commerce of the United States of America and the Delegation of Scientific and Technical Cooperation from the State Scientific and Technological Commission of the People's Republic of China (hereinafter referred to as the Parties) discussed the cooperative project of the National Center for Industrial Science and Technology Management Development (at Dalian, China) and have agreed to carry out the activities set forth in Annex IV.

The activities listed in Annex IV have been agreed upon in principle, but detailed arrangements for implementing these activities, including scheduling and payment of costs, will be made final in writing through consultation between the coordinators of the Parties.

I. In accordance with the Protocol between the USA and the PRC on Cooperation in the Fields of Management of Science and Technology and Scientific and Technical Information, the Parties agree to the establishment of the National Center for Industrial Science and Technology Management Development (at Dalian, China) (NCISTMD) for the training of managerial personnel in industry and science and technology. The Center is to be jointly sponsored by the US Department of Commerce and China's State Scientific and Technological Commission, the State Economic Commission and the Ministry of Education.

II. The Parties recognize that the Center, with the attention and support given to it by the governments of both countries and through the joint efforts of the teaching faculty from both sides, has successfully completed the teaching assignment for the first two sessions in 1980 and 1981, exchanged information and experience of management of industry and science and technology of the two countries, and strengthened friendship. The Center is of mutual benefit to both sides. The Parties agree to set the period of cooperation for the program to a total of five years, beginning 1980 through 1984. During the period of cooperation, the US side agrees to assume the major responsibility for teaching. Curriculum design will be jointly decided by the Parties through consultation. The US faculty will be assisted by a Chinese faculty to be recruited by the Chinese side.

III. The objectives of the Center during the five years are as follows:

1. The Center will complete the training of approximately one thousand (1000) enterprise directors and managers, government officials involved in the management of science and technology and industry, responsible persons of research academies and institutes, and teachers

of management at institutions of higher learning to enable them to get acquainted with the basic theory and methods of modern management of industrial enterprises as well as of science and technology in the United States.

2. To bring into full play the role of the Center, the US faculty will, while continuing the training of the above mentioned personnel, reinforce the special training of Chinese teachers, beginning from 1983.

IV. The US side will assist the Center in the collection of books, literature, and other reference materials in the field of management, with particular emphasis on management of industry and science and technology.

V. The US side will assist Chinese teachers and computer operating personnel to improve the handling of computers and their application to management.

VI. In order to accelerate the buildup of the Chinese faculty at the Center, the US side agrees to assist the Chinese side in seeking scholarships and fellowships for outstanding Chinese teachers to be selected and sent by the Center to the United States for advanced study or research.

VII. In order to establish the Center as one of the national training bases, the Chinese government has allocated capital construction funds for classroom and office buildings, dormitories and other facilities. The US side agrees to make an effort to collect appropriate teaching equipment for the Center.

VIII. To further the exchange of management science and management education between the USA and PRC and to extend the Center's influence, the Parties agree to organize academic symposia in China on topics of management of industry and science and technology. Details of the symposia shall be worked out later through consultation between the Parties.

IX. China will, to the extent possible, organize investigations and case studies to be carried out by Chinese and American teachers at appropriate industrial enterprises.

This Annex shall enter into force upon signing of the document in Washington on this first day of March, 1982 in duplicate in the English and Chinese languages, both equally authentic.

Eugene K. Lawson

FOR THE DEPARTMENT OF
COMMERCE OF THE
UNITED STATES OF AMERICA

杨纪珂

FOR THE STATE ECONOMIC
COMMISSION OF THE
PEOPLE'S REPUBLIC OF CHINA

IMPLEMENTING ACCORD
BETWEEN THE
DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA
AND THE
STATE SCIENTIFIC AND TECHNOLOGICAL COMMISSION
OF THE PEOPLE'S REPUBLIC OF CHINA
ON COOPERATION IN THE FIELD OF HIGH ENERGY PHYSICS

The Department of Energy of the United States of America and the State Scientific and Technological Commission of the People's Republic of China (hereinafter referred to as the Parties), for the purpose of promoting cooperation and collaboration in the field of high energy physics subject to the Agreement Between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology, signed in Washington, D.C. on January 31, 1979, have agreed as follows:

ARTICLE 1

The objective of this Accord is to further the energy programs of the Parties by establishing a framework for cooperation in the field of high energy physics, including theoretical and experimental research, accelerator design and construction techniques; and related technology areas as may be mutually agreed.

ARTICLE 2

Cooperation under this Accord may include the following forms:

1. Exchange and provision of information on scientific

and technical developments, activities, and practices;

2. Research and development activities in the form of experiments, tests, and other technical collaborative activities;

3. Exchange of scientists, engineers, and other specialists; including visits by specialist teams or individuals to the facilities of the other Party, and exchange of personnel for training purposes;

4. Exchange and provision of samples, materials, instruments, and components for testing and evaluation;

5. Such other forms of cooperation as are mutually agreed.

ARTICLE 3

Specific undertakings, obligations and conditions with respect to the conduct of each activity under Article 2 including responsibility for payment of costs shall be agreed by authorized entities on a case-by-case basis.

ARTICLE 4

1. For the purpose of coordinating activities pursuant to this Accord, a Committee on High Energy Physics is hereby established, consisting of representatives of the Parties and such other persons from each Party's national research community as it may designate. Each Party shall designate one person to act as its co-chairperson on the Committee.

2. The Committee will encourage contacts between scientists, universities, and laboratories of the two nations.

3. The Committee each year shall develop and maintain a listing of joint activities to be carried out, and, as

requested by the participating institutions and scientists, shall assist with arrangements for the listed activities. Items may be listed by consensus at meetings of the Committee, or, between meetings, by agreement of the co-chairpersons.

4. Each Party shall designate its members of the Committee within two months of the effective date of this Accord. The first meeting of the Committee should be held, if possible, within three months thereafter at an agreed site. Subsequently, the Committee shall meet in the United States and the People's Republic of China alternately at intervals of about 12 months or as agreed by the co-chairpersons.

5. The Committee shall be subject to the direction of the US-PRC Joint Commission on Scientific and Technological Cooperation established under the aforesaid Agreement of January 31, 1979, and shall periodically report the Status of its program to that Commission.

6. The Committee may assume other duties as mutually agreed by the Parties.

ARTICLE 5

The application or use of any information exchanged or transferred between the Parties under this Accord shall be the responsibility of the Party receiving it, and the transmitting Party does not warrant the suitability of such information for any particular use or application.

ARTICLE 6

The Parties recognize the need to agree upon provisions concerning protection of copyrights and treatment of inventions or discoveries made or conceived in the course of or under this Accord in order to facilitate specific activities hereunder. Accordingly, the Parties shall appoint experts in these two fields who shall separately recommend to the Parties detailed provisions which, if the Parties agree, shall be made an Annex to this Accord.

ARTICLE 7

Both Parties agree that in the event equipment is to be exchanged, or supplied by one Party to the other for use in cooperative activities, they shall enter into specific understandings on a case-by-case basis.

ARTICLE 8

1. Whenever an attachment of staff is contemplated under this Accord each Party shall ensure that staff with necessary skills and competence are selected for attachment to the other Party.

2. Each attachment of staff shall be the subject of an exchange of letters between the participating institutions, covering funding and other matters of interest not otherwise specified in this Accord.

3. Each Party shall provide all necessary assistance to the attached staff (and their families) of the other Party as regards administrative formalities, travel arrangements and accommodations.

4. The staff of each Party shall conform to the general rules of work and safety regulations in force at the host estab-

lishment, or as agreed in separate attachment of staff agreements.

ARTICLE 9

1. All questions related to this Accord or activities carried out hereunder shall be settled by mutual agreement of the Parties.

2. Each Party will accept liability to the extent authorized by its national laws for damages arising from cooperative activities under this Accord.

ARTICLE 10

1. This Accord shall enter into force upon signature, and, unless terminated earlier in accordance with paragraph 2 of this Article, shall remain in force for a five-year period. It may be amended or extended by mutual agreement of the Parties.

2. This Accord may be terminated at any time at the discretion of either Party, upon 6 months advance notification in writing by the Party seeking to terminate the Accord.

3. The termination of this Accord shall not affect the validity or duration of specific activities being undertaken hereunder.

DONE at Washington this 31st day of January, 1979, in duplicate in the English and Chinese languages, both equally authentic.

FOR THE DEPARTMENT OF ENERGY
OF THE
UNITED STATES OF AMERICA:

James R. Schlesinger

FOR THE STATE SCIENTIFIC
AND TECHNOLOGICAL COMMISSION
OF THE
PEOPLE'S REPUBLIC OF CHINA:

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ANNEX TO THE IMPLEMENTING ACCORD
BETWEEN THE
DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA
AND THE
STATE SCIENTIFIC AND TECHNOLOGICAL COMMISSION OF
THE PEOPLE'S REPUBLIC OF CHINA
ON COOPERATION IN THE FIELD OF HIGH ENERGY PHYSICS

In accordance with Article 6 of the Implementing Accord between the Department of Energy of the United States of America and the State Scientific and Technological Commission of the People's Republic of China on Cooperation in the Field of High Energy Physics (hereinafter referred to as the Implementing Accord), signed in Washington, D.C. on January 31, 1979 by the Department of Energy of the United States of America and the State Scientific and Technological Commission of the People's Republic of China (hereinafter referred to as the Parties), the Parties agree as follows:

ARTICLE 1

All information of each Party provided to the cooperative programs under this Implementing Accord and all information arising from this Implementing Accord may be published through scientific journals and other channels commonly used for dissemination of scientific and technological information. If there is a need to introduce in the cooperative programs information which is owned by a third party and which is to be protected, a decision to introduce such information shall be made through consultations by representatives of the two sides of the Committee. Each Party shall give protection to the above-mentioned information in accordance with the laws, regulations and practices of its own country.

ARTICLE 2

In this Annex, information to be protected shall mean information of a confidential nature as trade secrets and know-how which is appropriately marked and which meets all of the following conditions:

(a) it is of a type customarily held in confidence by commercial sources;

(b) it is not generally known or publicly available from other sources;

(c) it has not been previously made available by the owner to others without obligation concerning its confidentiality;

and

(d) it is not already in the possession of the recipient Party without obligation concerning its confidentiality.

ARTICLE 3

Either Party should communicate to the other Party information regarding inventions or discoveries on which patent or other protection is to be obtained, and may ask the latter to delay publication or public disclosure of such information, provided, however, that this restriction on publication or public disclosure shall not extend beyond six months from the date of the communication of such information.

ARTICLE 4

As to inventions or discoveries made or conceived during exchange of personnel; joint design, development or fabrication efforts of components or systems between the Parties; or as a result of joint experiments between the Parties; or such other forms of cooperation as are mutually agreed:

(a) each Party shall be entitled to all rights to and interests in such inventions or discoveries in its own country; and

(b) the Party on whose technology the invention or discovery is principally based, as determined by the Committee, shall be entitled to all rights to and interests in any invention or discovery in third countries, subject to a nonexclusive, irrevocable, royalty-free license to the other Party, its government and the nationals of its country designated by it.

ARTICLE 5

If in the course of execution of the cooperative programs, one Party procures from sources other than the other Party or its laboratories, directly or through the other Party or its laboratories, services for the design, development or fabrication of components or systems and thereupon makes or conceives an invention or discovery, the treatment of the rights to such invention or discovery shall be determined by that Party itself.

ARTICLE 6

Copyrights may be obtained by either Party on works originated under this Implementing Accord in accordance with the laws and regulations of its own country. However, the other Party must be granted a nonexclusive and royalty-free license to reproduce and distribute such works for any purpose.

ARTICLE 7

Each Party will take all necessary steps to provide the cooperation from its authors and inventors required to carry out the provisions of this Annex. Each Party shall assume the responsibility to pay awards or compensation required to be paid to nationals of its country according to the laws of its country.

ARTICLE 8

Other questions or issues regarding the treatment of information or inventions or discoveries not covered by this Annex shall be settled through consultations by the Committee.

ARTICLE 9

This Annex is made applicable to the Implementing Accord and is not made applicable to other agreements or protocols entered into pursuant to the Agreement between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology signed January 31, 1979, without express agreement of the two governments. This Annex shall enter into force upon signing and its term of validity, manner of termination and means of modification and extension are the same as the Implementing Accord.

Done at Beijing this twelfth day of June 1979, in duplicate in English and Chinese languages, both equally authentic.

FOR THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA:	FOR THE STATE SCIENTIFIC AND TECHNOLOGICAL COMMISSION OF THE PEOPLE'S REPUBLIC OF CHINA:
J E Leiss	张文裕

A true copy of the signed original.

PROTOCOL BETWEEN
THE DEPARTMENT OF ENERGY
OF THE
UNITED STATES OF AMERICA
AND
THE STATE SCIENCE AND TECHNOLOGY COMMISSION
OF THE
PEOPLE'S REPUBLIC OF CHINA
ON COOPERATION IN THE FIELDS OF
NUCLEAR PHYSICS AND CONTROLLED MAGNETIC FUSION RESEARCH

The Department of Energy of the United States of America and the State Science and Technology Commission of the People's Republic of China (hereinafter referred to as the Parties), for the purpose of promoting cooperation in the fields of Nuclear Physics and Controlled Magnetic Fusion Research, and, according to the Agreement between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology, signed in Washington, D.C., on January 31, 1979, have agreed as follows:

Article 1

The Parties agree, on the basis of equality, reciprocity and mutual benefit, to cooperate with each other in promoting each other's programs in Nuclear Physics and Controlled Magnetic Fusion.

Article 2

Cooperation under this Protocol may take the following forms:

1. Exchange and provision of information and data on scientific and technical development, activities and practices in the fields of nuclear physics and controlled magnetic fusion;

2. Research and development activities in the forms of experiments, tests, and other technical collaborative activities;

3. Exchange of scientists, engineers, and other specialists to the facilities of the other Party for visits or short-term work;

4. Exchange and provision of samples, materials, instruments, and components for scientific research;

5. Such other forms of cooperation as are mutually agreed.

Article 3

The Parties shall encourage and facilitate contacts, cooperation and specific cooperative activities between universities, research institutions and scientists of the two countries.

Article 4

A Working Group shall be set up to coordinate the activities stipulated under this Protocol and its Annexes. Each Party shall designate three persons to be members of the Working Group, one as Co-Chairperson for overall coordination, one as Coordinator for Nuclear Physics and one as Coordinator for Controlled Magnetic Fusion. The Coordinators shall, by correspondence, consult with each other and define the cooperative activities and other relevant matters. When necessary, a meeting may be called by mutual agreement to consider matters related to the implementation of this Protocol.

Article 5

The specific tasks, obligations, and conditions, with respect to the stipulated activities of this Protocol and its Annexes, including responsibility for the payment of costs, shall be decided through mutual agreement by the Parties on a case-by-case basis.

The specific cooperative activities, as mutually agreed, shall be embodied in Annexes to this Protocol. The specific arrangements, including financial arrangements for these activities, shall be confirmed by correspondence between Coordinators or their representatives.

Article 6

All activities stipulated under this Protocol and its Annexes shall be conducted under the guidance of the US-PRC Joint Commission on Scientific and Technological Cooperation.

Article 7

The application or use of any information exchanged or transmitted between the Parties under this Protocol shall be the responsibility of the Party receiving it, and the transmitting Party does not warrant the suitability of such information for any particular use or application.

Article 8

The Parties agree to reach an accord concerning protection of copyrights and treatment of inventions or discoveries made or conceived under this Protocol in order to undertake specific activities. Such accord shall be made as an Annex to this Protocol.

Article 9

The Parties agree that in the event equipment is to be exchanged or supplied by one Party to the other Party for use in cooperative activities, they shall enter into specific understandings on a case-by-case basis.

Article 10

1. Whenever an attachment of staff is contemplated under this Protocol, both Parties shall be satisfied that only staff with necessary skills and competence are selected.

2. Each attachment of staff shall be made through an exchange of letters between the participating institutions concerning funding and other relevant matters not specified in this Protocol.

3. Each Party shall provide all necessary assistance to the attached staff (and their families) of the other party as regards administrative formalities, travel arrangements and accommodations.

Article 11

All cooperative activities under this Protocol shall be subject to the availability of funds and personnel and to the laws and regulations of the respective countries.

Article 12

1. All issues related to this Protocol or occurring in the activities carried out hereunder shall be settled by agreement of the Parties.

2. Each Party will accept liability to the extent authorized by its national laws and regulations for damages arising from cooperative activities under this Protocol.

Article 13

1. This Protocol shall enter into force upon signature, and, unless terminated earlier in accordance with paragraph 2 of this Article, shall remain in force for a five-year period. It may be amended or extended by mutual written agreement of the Parties.

2. This Protocol may be terminated at any time at the discretion of either Party, upon six months advance notification in writing by the Party seeking to terminate the Protocol.

3. The termination of this Protocol shall not affect the validity or duration of the specific activities initiated but uncompleted under this Protocol.

Done at Beijing, on the Eleventh day of May of 1983, in duplicate in the English and Chinese languages, both equally authentic.

For the
Department of Energy
of the
United States of America

For the
State Science and
Technology Commission
of the
People's Republic of China

PROTOCOL BETWEEN
THE DEPARTMENT OF TRANSPORTATION
OF THE
UNITED STATES OF AMERICA
AND
THE MINISTRY OF COMMUNICATIONS
OF THE
PEOPLE'S REPUBLIC OF CHINA
ON COOPERATION IN SCIENCE AND TECHNOLOGY OF
TRANSPORTATION

The Department of Transportation of the United States of America and the Ministry of Communications of the People's Republic of China (hereinafter referred to as the Parties), in accordance with and subject to the Agreement between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology, signed in Washington, D. C., on January 31, 1979, and for the purpose of promoting scientific and technical cooperation and collaboration in the field of transportation, have reached agreements as follows:

Article 1

The Parties agree to undertake cooperation and collaboration in science and technology of transportation on the basis of equality, reciprocity and mutual benefit.

Article 2

The Parties agree that cooperation may include science and technology in the following fields:

1. Port engineering;
2. Waterborne transportation;
3. Shipping management;
4. Highway engineering;
5. Traffic management systems;
6. Urban transportation;
7. Other fields as mutually agreed.

Article 3

The Parties agree that cooperation may include the following

1. Exchange of scientific and technical information (in the language of the providing Party) on subjects of common interest;

2. Exchange of specialists, scholars, delegations and scientific and technical personnel;

3. Cooperative research on subjects of mutual interest;

4. Joint organization of symposia and seminars;

5. Exchange and provision of samples, materials, data, instruments and components for testing, evaluation and other purposes;

6. Other forms of cooperation as mutually agreed.

Article 4

Cooperation under this Protocol will be subject to the availability of funds and manpower for the Parties. The specific tasks, obligations and conditions with respect to the activities under Article 3 of this Protocol, including the responsibility for the payment of expenses, shall be decided by mutual agreement on a case-by-case basis.

Article 5

Scientific and technical information derived from the cooperative activities under this Protocol may be made available to the world scientific community, unless otherwise agreed.

Article 6

All activities under this Protocol shall be conducted under the guidance of the US-PRC Joint Commission on Scientific and Technological Cooperation.

In order to coordinate the cooperative activities, each Party shall designate a representative to be responsible for determining the particular directions of cooperation and for ensuring the effectiveness of exchanges. The representatives of the Parties or their designated coordinators will, by correspondence, consult with each other and define the cooperative activities and other related matters. When necessary, and as mutually agreed, they shall meet to consider matters related to the implementation of this Protocol.

The Parties shall name their respective representatives within thirty (30) days of the effective date of this Protocol.

Article 7

Specific activities as mutually agreed, including the financial arrangements, shall be embodied in the Annexes to this Protocol. The Annexes will be concluded by the representatives of both Parties through correspondence.

Article 8

1. The Parties agree that any information of a confidential nature exchanged under this Protocol or Annexes (such as trade secrets and technical know-how or information with obligations concerning its confidentiality requested by either Party) shall be protected.

2. Any information transmitted by one Party to the other Party under this Protocol shall be accurate and reliable to the best knowledge and belief of the providing Party, but the providing Party does not warrant the suitability of such information for any particular use or application by the receiving Party.

Article 9

1. This Protocol shall enter into force upon signature, and shall remain in force for a five-year period. It may be amended or extended by mutual agreement of the Parties.

2. The termination of this Protocol shall not affect the validity or duriation of the specific activities being undertaken hereunder.

Done at Beijing, on the Eleventh day of May 1983, in duplicate in the English and Chinese languages, both texts being equally authentic.

For the Department of Transportation of the United States of America	For the Ministry of Communications of the People's Republic of China

UNDERSTANDING ON COOPERATION IN SPACE TECHNOLOGY BETWEEN THE UNITED STATES OF AMERICA AND THE PEOPLE'S REPUBLIC OF CHINA

During a visit to the United States in November and December 1978 by a delegation headed by Dr. Jen Hsin-min, Director of the Chinese Academy of Space Technology, an understanding in principle was reached with a delegation headed by Dr. Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, on U.S.-Chinese cooperation in the peaceful utilization of space technology.

This understanding includes:

1. Cooperation in the development of the civil broadcasting and communications system of the PRC. The PRC intends, under suitable conditions, to purchase a U. S. satellite broadcasting and communications system, including the associated ground receiving and distribution equipment. The space portion of the system will be launched by NASA and placed in geostationary orbit by a U. S. contractor, with continued operation to be carried out by China; and

2. The intended purchase, under suitable conditions, by the PRC of a U. S. ground station capable of receiving earth resources information from the NASA Landsat remote

sensing satellites, including the Landsat now under development.

It was also agreed that, through further discussions and correspondence, both sides would develop the details of the understanding described above and consider other fields of civil space cooperation which could be of mutual interest and benefit.

A true copy of the signed original

MEMORANDUM OF UNDERSTANDING
BETWEEN THE
UNITED STATES NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND THE
CHINESE ACADEMY OF SCIENCES

The United States National Aeronautics and Space Administration (NASA) and the Chinese Acadumy of Sciences (CAS) note that NASA is now conducting an experimental Landsat Program and, under certain conditions, provides for direct reception of data from these satellites by stations operated outside the United States. Further, both sides note that CAS plans, under suitable conditions, to establish a station to receive, process, archive and disseminate Landsat data. Both parties have decided to enter into this Memorandum of Understanding which, subject to terms and conditions mutually agreed upon, provides for (a) direct reception of data from the Multispectral Scanner, Thematic Mapper and other instruments on NASA's currently operating and potential future experimental Landsat satellites by CAS's ground station and (b) availability to NASA and others of Landsat data acquired by this CAS station.

1. For its part, CAS will:
   - (a) set up and operate the ground station at or near Beijing for the reception and facilities for processing, archiving and dissemination of Landsat data at its own cost, including the cost of the necessary communication links with the NASA Landsat Operations Control Center at the Goddard Space Flight Center, Greenbelt, Maryland;
   - (b) produce Landsat Computer Compatible Tapes and image products;

(c) if and when Principal Investigators are selected for research activities involving data from the Beijing ground station, provide processed Landsat data (imagery and digital products) to those whose research sites are within range of that station, for the period of coverage envisaged;

(d) during a spacecraft emergency condition, if requested by NASA, furnish reasonable support such as the provision of station tapes or high density digital tapes, should NASA have problems with data transmission;

(e) provide at no charge to NASA and the U.S. EROS Data Center monthly catalog listings in agreed format of all the Landsat data acquired by the Beijing ground station. These catalog listings will be made publicly available through the EROS Data Center;

(f) make available to NASA on request, for U.S. Government experimental purposes, on a cost-free basis and in reasonable quantities, specified processed or unprocessed Landsat data, including the original station tapes acquired by CAS.

2. For its part, NASA will:

(a) within the technical parameters of the satellite system, program the Landsat Multispectral Scanner and Thematic Mapper instruments, as requested, for coverage of the area within the acquisition radius of the Beijing ground station and transmit the data acquired directly to this station. Programming details will be arranged by mutual agreement of the Project Managers;

(b) provide the Beijing ground station with orbital elements for calculating the antenna pointing angles necessary to acquire the Landsat transmitted signal and for processing the data acquired;

(c) process at no charge on a time-available basis and, as agreed by the designated technical representatives, a limited number of CAS data tapes for initial evaluation and calibration of the Beijing station's performance. CAS will ensure that such data tapes are fully compatible with NASA's data processing equipment and related software;

(d) make available to CAS for comparison purposes, cost-free, a limited amount of Landsat data acquired by NASA covering selected portions of the Beijing station's coverage zone.

3. NASA and CAS will each designate technical representatives to be responsible for coordinating with each other the agreed functions and responsibilities. Upon request, NASA and CAS will facilitate visits to their Landsat ground stations by each other's representatives.

The technical representatives, or their deputies and advisers, by mutual agreement, will participate in meetings of the Landsat Ground Station Operators Working Group. This Working Group, established by NASA, meets every six months and serves as a forum for exchange of technical information among station operators.

4. The following additional understandings are confirmed:

   (a) CAS, in conjunction with other Chinese agencies, will use its best efforts to ensure that any radio frequency problem occurring in relation to Landsat data reception by the Beijing station is resolved to the satisfaction of the parties to this Memorandum of Understanding. Questions concerning radio frequency interference by the Landsat spacecraft raised by parties in third countries will be referred to the U.S. Government and NASA for reply. NASA plans to use the following frequencies for sensor data transmission from the experimental Landsat-D spacecraft:

   Multispectral Scanner -- S-Band (2200-2300 MHz) and X-Band (8025-8400 MHz);

   Thematic Mapper — X-Band (8025-8400 MHz).

   CAS and other related Chinese agencies will pursue a Landsat open data policy similar to that of NASA and other related U.S. agencies. CAS will openly and uniformly provide at a fair and reasonable price all Landsat data receivable by the Beijing ground station.

(c) It is understood that the NASA Landsat program is experimental in character and therefore subject to change in accordance with modifications in technical requirements and opportunities. NASA, however, undertakes to keep CAS informed in good time of any modifications to the satellite or to its plans for future satellites which may affect the implementation of this Memorandum of Understanding.

(d) NASA and CAS will exchange, upon request, such technical information as is mutually agreed to be necessary for the implementation of this Memorandum of Understanding and is consistent with the export regulations of the two countries.

(e) NASA and CAS may each release public information regarding their own activities under this Memorandum of Understanding and, after suitable consultation, regarding activities involving the other party.

(f) Construction of the Beijing ground station will be underway within fifteen months of the signing of this Memorandum of Understanding. In the event that construction of the Beijing station is not underway within fifteen months of the signing of this Memorandum of Understanding, NASA, after consultation with CAS, shall have the option to terminate its activities under this Memorandum of Understanding.

(g) NASA will retain responsibility for spacecraft control, health, and status throughout the execution of this Memorandum of Understanding.

(h) When the expected coverage of a prospective Landsat ground station overlaps with that of the Beijing station, NASA will inform CAS and will advise the prospective station operator of this NASA-CAS Memorandum of Understanding which provides for the open and uniform public availability of data acquired of areas within range of the Beijing station at a fair and reasonable charge. Should the prospective station operator choose to pursue plans for a station with substantially overlapping coverage, NASA will encourage the prospective station operator and CAS to consult with a view toward reaching a mutually satisfactory understanding on responding to requests for data of the overlapping coverage area.

(i) With all responses to requests for Landsat data acquired in the Beijing station's coverage zone, the U.S. EROS Data Center will include a statement noting that the Beijing station should have available more recent and/or more complete data. In the event that the EROS Data Center receives requests for specific Landsat scenes, products, or detailed information on their holdings, EROS will supply the data and/or information requested.

(j) The ability of NASA and CAS to carry out their responsibilities under this Memorandum of Understanding is subject to the availability of appropriated funds.

5. In consideration of the costs NASA is bearing for the Landsat space segment, CAS will provide to NASA the sum of $200,000 per annum beginning six months after the date the Beijing station begins to acquire Landsat data. CAS will pay this sum in quarterly installments at the end of each quarter. After January 1, 1981, NASA may, after consultation with foreign ground station operators, revise the rate and arrangements. Such revised financial arrangements will be applied to all non-US Landsat stations on an equitable basis.

6. This Memorandum of Understanding shall enter into force after signature by both parties and confirmation by the Government of the United States of America and the Government of the People's Republic of China through an exchange of diplomatic notes. This Memorandum of Understanding shall continue in force for a period of four years, subject to extension as may be agreed by the parties and their respective governments.

Done at Beijing, this 24th day of January, 1980, in duplicate, in the English and Chinese languages, both texts being equally authentic.

FOR THE NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION

FOR THE CHINESE ACADEMY
OF SCIENCES

嚴濟慈

PROTOCOL
ON COOPERATION IN AERONAUTICAL SCIENCE AND TECHNOLOGY
BETWEEN THE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
OF THE
UNITED STATES OF AMERICA
AND THE
CHINESE AERONAUTICAL ESTABLISHMENT
OF THE
PEOPLE'S REPUBLIC OF CHINA

The National Aeronautics and Space Administration of the United States of America and the Chinese Aeronautical Establishment of the People's Republic of China (hereinafter referred to as the Parties), in accordance with the Agreement between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology, signed in Washington, D.C., on January 31, 1979, for the purpose of promoting cooperation and collaboration in civil aeronautical science and technology, have agreed as follows:

Article 1

The Parties agree to conduct exchanges and collaborative activities on the basis of equality, reciprocity and mutual benefit.

Article 2

The Parties agree that cooperation may include, but is not limited to these fields: theoretical, computational and experimental aerodynamics; basic jet propulsion technologies; aircraft structure and materials; and aero-simulation techniques.

Article 3

The Parties agree that cooperation may include the following forms:

(A) Exchange the provision of information and documentation on scientific and technical developments, activities and practices relevant to joint endeavors or areas of mutual interest to be defined;

(B) Exchange of scientists, specialists and delegations to lecture, survey or participate in the work of the other Party;

(C) Exchange of scientific and technical personnel;

(D) Joint organization of scientific conferences and symposia;

(E) Collaborative research on subjects of mutual interest and joint research programs including the use of scientific and technical facilities;

(F) Such other forms of cooperation as are mutually agreed.

Article 4

The cooperative activities carried out under this Protocol will be subject to the availability of funds and manpower to the Parties. The specific tasks, obligations and conditions with respect to the above-mentioned activities, including responsibility for the payment of costs, shall be embodied in Annexes to this Protocol. In the case of mutual exchanges, it is agreed that the dispatching Party shall cover international round-trip travel expenses and that the receiving Party shall bear the expense of lodging, board, and transportation within its territory. In the case of non-reciprocal exchanges, the Parties shall decide to share the costs through consultation on a case-by-case basis according to the extent of benefits.

Article 5

In order to coordinate the activities under this Protocol, a Working Group of the Parties shall be established. Each Party will designate three persons to be members of the Working Group, one of whom from each Party will act as Co-Chairperson. The Co-Chairpersons designated by each Party may, by correspondence or other appropriate means, negotiate new or revised Annexes to this Protocol encompassing new or significantly revised cooperative projects for approval by the Parties; coordinate and implement existing agreed projects; and discuss other related matters.

Article 6

Scientific and technical information transmitted by one Party to another Party under Article 3 of this Protocol shall be accurate to the best of the knowledge and belief of the transmitting Party, but the transmitting Party does not warrant the suitability of the scientific and technical information transmitted for any particular use or application by the receiving Party or by any third Party.

Article 7

Scientific and technical information derived from cooperative activities under this Protocol may be made available, unless otherwise agreed in Article 8 of this Protocol, to the world scientific community through customary channels and in accordance with the normal procedures of the Parties.

Article 8

The Parties agree to reach an accord concerning the protection of copyrights and confidential information and the treatment of inventions or discoveries made or conceived under this Protocol in order to undertake specific activities. Such accord shall be made as an Annex to this Protocol.

Article 9

All activities under this Protocol shall be conducted under the guidance of the US-PRC Joint Commission on Scientific and Technological Cooperation established pursuant to the Agreement on Cooperation in Science and Technology between the two Governments, signed on January 31, 1979.

Article 10

(A) The Protocol shall enter into force upon signature, and shall remain in force for a five-year period. It may be amended or extended by mutual agreement of the Parties.

(B) The termination of this Protocol shall not affect the validity or duration of specific activities being undertaken hereunder.

Done at Beijing, on the Eleventh day of May of 1983, in duplicate in the English and Chinese languages, both equally authentic.

Jack L Kerrebrock

For the
National Aeronautics and
Space Administration
of the
United States of America

For the
Chinese Aeronautical
Establishment
of the
People's Republic of China

PROTOCOL BETWEEN
THE NUCLEAR REGULATORY COMMISSION
OF THE UNITED STATES OF AMERICA
AND
THE STATE SCIENTIFIC AND TECHNOLOGICAL COMMISSION
OF THE PEOPLE'S REPUBLIC OF CHINA
ON COOPERATION IN NUCLEAR SAFETY MATTERS

The Nuclear Regulatory Commission of the United States of America and the State Scientific and Technological Commission of the People's Republic of China (hereinafter referred to as the Parties), in accordance with and subject to the Agreement between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology, signed in Washington, D.C. on January 31, 1979, and with the intent of promoting cooperation and collaboration in nuclear safety matters, have agreed as follows:

ARTICLE 1

On the basis of equality, reciprocity and mutual benefit, the Parties agree to conduct exchanges and collaborative activities in the field of nuclear safety, including as described herein, safety technology research for nuclear power plants, analysis of accidents and regulation of nuclear safety (e.g. examination and approval, regulations and inspections for nuclear power plants).

ARTICLE 2

To the extent that it is permitted to do so under its laws, regulations, and policy directives, the U.S. side shall provide the following types of information contributing to the safe regulation of peaceful nuclear power installations to the Chinese side:

1. Code of Federal Regulations and examination and approval process and regulations for nuclear power plants;
2. Safety Regulatory Guides;
3. Publications which describe the regulatory process, as they are available;
4. Technical reports of a generic nature;
5. Weekly compilation of news releases;
6. Power reactor current events and construction and operating experience bulletins.

To the extent that it is permitted to do so under its laws, regulations and policy directives, the Chinese side shall provide the following types of information contributing to the safe regulation of peaceful nuclear power installations to the U.S. side:

1. Nuclear regulatory reports;
2. Copies of safety guides and standards;
3. Publications which describe construction and operating experience, safety research and regulation of nuclear power plants after their completion.

ARTICLE 3

1. Within the limits of available resources and legislative authority, the U.S. side shall assist the Chinese side in providing certain training and experience for the safety personnel. The following are typical of the kinds of on-the-job training and experience that may be provided:

(a) Chinese inspectors accompaniment of U.S. inspectors on operating reactor and reactor construction inspections in the U.S.;

(b) Participation by Chinese personnel in U.S. NRC staff training courses conducted in Bethesda, Maryland;

(c) Assignment of permanent Chinese personnel to work within the U.S. NRC staff to gain experience in the practices and procedures followed by the U.S. NRC in its regulation of U.S. nuclear reactor safety and environmental impact.

To the extent that the documents and other technical assistance provided by the U.S. NRC are not adequate to meet the needs of the Chinese side for technical advice, the Parties will consult on the best means for meeting such needs.

2. The Chinese side shall welcome U.S. personnel in specific fields to visit China and hold joint discussions on nuclear safety regulatory activities. The Chinese side shall make every effort to assist the U.S. side in meeting its requests for information on nuclear regulatory activities.

ARTICLE 4

The execution of joint programs and projects of safety research and development, or those programs and projects under which activities are divided between the Parties including the use of test facilities and/or computer programs owned by either Party, will be agreed upon on a case-by-case basis. However, each Party, based on its own research, will transmit immediately to the other Party information concerning research results known to have urgent safety implications for nuclear facilities operating in the country of the other Party.

Temporary assignments of qualified personnel by one Party in the other Party's agency will also be considered on a case-by-case basis.

ARTICLE 5

It is understood that exchanges of information and technology undertaken in connection with these cooperative efforts shall be limited to those which are useful in the development of a nuclear safety regulatory program. Neither Party is required to take any action which would be inconsistent with its laws, regulations and policy directives. No nuclear information related to proliferation-sensitive technologies shall be exchanged.

ARTICLE 6

This Protocol shall be subject to the availability of funds and manpower to each Party. The payment of costs shall be decided by mutual written agreement on a case-by-case basis. In principle the sharing of costs between the Parties shall be decided according to the extent of benefit by each Party.

ARTICLE 7

All stipulated activities under the Protocol shall be conducted under the guidance of the US-PRC Joint Commission on Scientific and Technological Cooperation.

In order to coordinate the stipulated activities under this Protocol, each Party shall designate a representative. The representatives designated by each Party may, by correspondence, decide upon the adoption, coordination and implementation of cooperative activities and on other related matters. When necessary, the representatives, by mutual agreement, may call meetings on an irregular basis to consider matters related to the implementation of this Protocol.

ARTICLE 8

Scientific and technological information derived from cooperative activities under this Protocol may be made available, unless otherwise agreed in writing between the two Parties, to the world scientific community through customary channels and in accordance with the normal procedures and domestic laws of the Parties.

ARTICLE 9

The application or use of any information exchanged or transferred between the Parties under this Protocol shall be the responsibility of the receiving Party, and the transmitting Party does not warrant the suitability of such information for any particular use or application.

ARTICLE 10

1. This Protocol shall enter into force upon signature, and, unless terminated earlier in accordance with paragraph 2 of this Article, shall remain in force for a five-year period. It may be amended or extended by mutual written agreement .

2. This Protocol may be terminated at any time at the discretion of either Party, upon 6 months advance notification in writing by the Party seeking to terminate the Protocol.

3. The termination of this Protocol shall not affect the validity or duration of specific activities being undertaken hereunder.

Done at Washington this 17th day of October 1981, in duplicate in the English and Chinese languages, both equally authentic.

For the Nuclear Regulatory Commission of the United States of America	For the State Scientific and Technological Commission of The People's Republic of China
______________________	______________________

PROTOCOL BETWEEN THE ENVIRONMENTAL PROTECTION AGENCY OF THE UNITED STATES OF AMERICA AND THE OFFICE OF THE ENVIRONMENTAL PROTECTION LEADING GROUP OF THE STATE COUNCIL OF THE PEOPLE'S REPUBLIC OF CHINA FOR SCIENTIFIC AND TECHNICAL COOPERATION IN THE FIELD OF ENVIRONMENTAL PROTECTION

The Environmental Protection Agency of the United States of America and the Office of the Environmental Protection Leading Group of the State Council of the People's Republic of China (hereinafter referred to as the Parties), in accordance with and subject to the Agreement Between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology, signed in Washington, D.C., on Januury 31, 1979, and in order to promote scientific and technical cooperation and collaboration in the field of environmental protection, have agreed as follows:

Article 1.

The Parties agree to conduct exchanges and cooperative activities on the basis of equality, reciprocity, and mutual benefit.

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Article 2

The Parties agree to cooperate with each other in the field of the science and technology of environmental protection. Cooperative activities may be undertaken in such fields as air pollution, water pollution, soil pollution, marine pollution, effects of environmental protection on human health and ecological systems, improvement to urban environment, preservation of nature, environmental legislation, environmental management, environmental economics and other areas of mutual interest.

Article 3

The Parties agree that cooperation under this Protocol may include the following forms:

1. Exchange of scientists, scholars, specialists and delegations;

2. Exchange and provision of scientific and technical information in the field of environmental protection;

3. Cooperative research on subjects of mutual interest;

4. Joint organization of symposia, seminars, lectures and training courses;

5. Exchange and provision of samples, reagents, materials, data, instruments and components for testing, evaluation and other purposes;

6. Such other forms of cooperation as are mutually agreed.

Article 4

The Parties shall encourage and facilitate the development of contacts and cooperation between government agencies, research institutions, industrial enterprises, universities and other entities concerned with cooperative activities and coordinate the implementation of these activities.

The Environmental Protection Agency of the United States of America shall coordinate the cooperative activities under this Protocol of the participating agencies on the United States side, and the Office of the Environmental Protection Leading Group of the State Council of the People's Republic of China shall coordinate the cooperative activities under this Protocol of the participating agencies on the Chinese side.

Article 5

The cooperative activities carried out under this Protocol will be subject to the funds and manpower available to the Parties.

The specific tasks, obligations and conditions, with respect to the above-mentioned activities, including the responsibility for the payment of costs, shall be decided by mutual agreement on a case-by-case basis.

All written material and information, reference standards, reagents and samples necessary for the implementation of cooperative activities shall normally be exchanged at no charge except as may be otherwise agreed.

Article 6

In order to coordinate the activities under this Protocol, a Working Group of the Parties shall be established. Each Party will designate three persons to be members of the Working Group, one of whom will act as co-chairperson. The co-chairperson designated by each Party may, by correspondence, decide upon the adoption, coordination and implementation of cooperative activities and on other relevant matters. When necessary, the co-chairpersons, by mutual agreement, may call meetings of the Working Group on an irregular basis to consider matters related to the implementation of this Protocol.

Article 7

The specific activities and the terms under which they will be conducted, as mutually agreed, including financial arrangements, shall be embodied in Annexes to this Protocol. New cooperative programs will be confirmed by correspondence between the two co-chairpersons, and such new agreements will be attached as Annexes to this Protocol.

Article 8

Scientific and technical information derived from cooperative activities under this Protocol may be made available, unless otherwise agreed upon in an Annex to this Protocol, to the world scientific community through customary channels and in accordance with the normal procedures of the Parties.

Article 9

All activities under this Protocol shall be conducted under the guidance of the US/PRC Joint Commission on Scientific and Technological Cooperation, established pursuant to the aforementioned Science and Technology Agreement.

Article 10

1. This Protocol shall enter into force upon signature, and shall remain in force for a five-year period. It may be amended or extended by mutual agreement of the Parties.

2. The termination of this Protocol shall not affect the validity or duration of specific activities being undertaken hereunder.

Done at Beijing this fifth day of February 1980, in duplicate in the English and Chinese languages, both equally authentic.

For the Environmental Protection Agency of the United States of America	For the Office of the Environmental Protection Leading Group of the State Council of the People's Republic of China
Douglas M. Costle	李超伯

ROTOCOL BETWEEN THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND THE OFFICE OF THE ENVIRONMENTAL PROTECTION LEADING GROUP OF THE STATE COUNCIL OF THE PEOPLE'S REPUBLIC OF CHINA FOR SCIENTIFIC AND TECHNICAL COOPERATION IN THE FIELD OF ENVIRONMENTAL PROTECTION

ANNEX 1

ENVIRONMENTAL HEALTH RESEARCH

I. GENERAL

This Annex presents selected study areas for cooperative research on environmental health research. A detailed joint proposal for each specific project will be approved by the working group. Joint proposals for each project will be prepared by the performing institution and/or scientists and their corresponding counterpart. The selected study areas below do not exclude other cooperative activities or projects which might be deemed desirable by the parties for inclusion under this Protocol.

II. ITEMS FOR COOPERATION

A. The influence of air pollution from coal combustion on the morbidity of lung cancer and upper respiratory tract:

1. Identify the metabolites of polycyclic aromatic hydrocarbon (such as benzo-a-pyrene) in animals and humans exposed in situ to coal smoke at selected site in China.

a. The U.S. side will send an analytical chemist to work at the Institute of Hygiene, Chinese Academy of Medical Sciences, on or about May 1981 for two months. The U.S. side will pay the international travel costs and China will pay for the expenses (of board, lodging, transportation and emergency medical services) incurred by the U.S. experts while they are in China, as allowed by Chinese laws and regulations.

b. The Chinese side will send an analytical chemist to work in a designated U.S. institution on or about January 1981 for two months to study the standardized monitoring methods of air pollution, particularly in the establishment of the analytical methods of fine particulates. The Chinese side will pay the international travel costs and the U.S. will pay for expenses (such as travel, lodging, board and emergency medical costs) incurred by the Chinese experts while they are in the United States, as allowed by U.S. laws and regulations.

2. The Chinese side will measure indoor and outdoor levels of pollutants in the coal combustion area, including polycyclic aromatic hydrocarbons (such as benzo-a-pyrene), heavy metals, sulfur dioxides, H_2SO_4 aerosol and fine particles.

The U.S. side will provide the standard reference materials, where appropriate to the study objectives and availability.

3. Studies on acute and chronic inhalation toxicity and carcinogenesis, teratogenesis, and mutagenesis on animals with coal smoke extracts.

a. The U.S. side will send a toxicologist to work in The Institute of Hygiene, Chinese Academy of Medical Sciences on or about May 1981 for two months. The U.S. side will pay the international travel costs and China will pay for the expenses (of board, lodging, transportation and emergency medical services) incurred by the U.S. experts while they are in China, as allowed by Chinese laws and regulations.

b. The Chinese side will send a toxicologist to a designated institution on or about October 1980 for two months to study the current techniques for the rapid identification of carcinogens and mutagens, and the experimental procedures of the inhalation tests. The Chinese side will pay the international travel costs and the U.S. will pay for expenses (such as travel, lodging, board and emergency medical costs) incurred by the Chinese experts while they are in the United States, as allowed by U.S. laws and regulations.

4. A heavily polluted area caused by coal combustion in China will be selected for study in the area of environmental epidemiology on lung cancer, the rate of occurring incidence, and mortality of lung cancer and upper respiratory diseases.

a. The U.S. side will send an epidemiologist to work in the Instituta of Hygiene, Chinese Academy of Medical Sciences, on or about May 1981 for one month. Papers relevant to the special pollutants and reagents used in the epidemiological investigation will be brought over. The U.S. side will pay the international travel costs and China will pay for the expenses (of board, lodging, transportation and emergency medical services) incurred by the U.S. experts while they are in China, as allowed by the Chinese laws and regulations.

b. The Chinese side will send an epidemiologist to work in a designated institution on or about December 1980 for one month to exchange experiences in epidemiological methods, statistical methods, and methods for detecting specified pollutants. The Chinese side will pay the international travel costs and the U.S. will pay for expenses (such as travel, lodging, board and emergency medical costs) incurred by the Chinese experts while they are in the United States, as allowed by U.S. laws and regulations.

B. Health effects of drinking water contamination:

1. Conduct monitoring, conduct data collection, and determine trace element and organic compound concentrations in drinking water in some cities of China:

a. The U.S. side will send a water quality analysis expert to work at the Institute of Hygiene, Chinese Academy of Medical Sciences. The U.S. side will pay the international travel costs and China will pay for the expenses (of board, lodging, transportation and emergency medical services) incurred by the U.S. experts while they are in China, as allowed by the Chinese laws and regulations.

b. The Chinese side will send a water quality analysis expert to work in the designated institution on or about August 1980 for two months to learn water analytical methods, especially the analysis of trace organic chemicals in water. The Chinese side will pay the international travel costs and the U.S. will pay for expenses (such as transportation, lodging, board and emergency medical costs) incurred by the Chinese experts while they are in the United States, as allowed by U.S. laws and regulations.

2. Both sides will engage in joint projects to develop certain population studies in both countries that could show correlations between occurrence of cardiovascular and other diseases due to drinking water contamination with organic chemicals and metals. This project will begin in 1981 with the development of an investigation plan by specialists of the two sides.

C. Biological accumulation of environmental pollutants:

1. Both sides will conduct joint studies to develop methods for analysis of pollutants in animal and human samples, especially the methods for mercury, lead, cadmium, and chlorinated hydrocarbons pesticide residues:

a. The U.S. side will send an expert to work at the Institute of Hygiene, Chinese Academy of Medical Sciences, on or about April 1981 for two months. The U.S. side will pay the international travel costs and China will pay for the expenses (of board, lodging, transportation and emergency medical services) incurred by the U.S. experts while they are in China, as allowed by the Chinese laws and regulations.

b. The Chinese side will send an expert to work in a designated institution on or about February 1981 for two months to exchange experiences in the analytical methods of heavy metals and organic chlorinated pesticides in biological media. The Chinese side will pay the international travel costs and the U.S. will pay for expenses (such as travel, lodging, board and emergency medical costs) incurred by the Chinese experts while they are in the United States, as allowed by U.S. laws and regulations.

c. The U.S. side will provide standard reference materials for the analysis of pollutants in humans and animals where appropriate to the study objectives and availability.

2. Joint studies to predict the degree of absorption, distribution, and accumulation of pollutants in human, animal, and plant tissues, and also the background value of pollutants in the human body in some areas:

a. Both sides participate in the project planning, including the analytical methods, sampling methods, pollutant selection. The study is to be conducted in both countries and the achievements will be exchanged.

b. These studies could be assisted by data that the U.S. side has collected in the specimen bank at the Oak Ridge National Laboratory and at the U.S. Environmental Protection Agency-National Bureau of Standards Joint Specimen Bank.

c. These projects will be started in 1981.

III. GENERAL PROVISION

A. A U.S. team of scientists will visit China in October 1980 to explore and define the proposed studies in detail and identify institutes appropriate for the assignment of U.S. scientists. The U.S. side will pay the international travel costs and China will pay for the expenses (such as transportation, lodging, board and emergency medical costs) incurred by the U.S. experts while they are in China, as allowed by the Chinese laws and regulations. A Chinese team of scientists will visit the U.S. in 1981 to further define proposed studies and identify institutes appropriate for the assignment of Chinese scientists. The Chinese side will pay the international travel costs and the U.S. will pay for expenses (such as travel, lodging, board and emergency medical costs) incurred by the Chinese experts, while they are in the United States, as allowed by U.S. laws and regulations. The delegations of scientists from each country will be of equal size and duration.

B. The investigation plan will be negotiated by specialist groups from both sides who would identify the appropriate equipment for the research study. Cooperative research in China will begin with the equipment and facilities provided mainly by the Chinese side. The U.S. side will actively consider providing appropriate equipment (to include, but not restricted to, HPLC with fluorescent detector, GC/MS equipment, and atomic absorption spectrophotometer with high-temperature furnace) that cannot be provided by the Chinese side for the duration of the cooperative research study. For those equipments provided by the U.S., the property rights belong to the U.S. These discussions may also be continued in the future as the implementation plans and studies are defined.

C. The details on allocation of research costs and other expenses related to implementation of this Annex will be decided in future discussions between the two sides on the basis of equality, reciprocity, and mutual benefit. These details shall be embodied as amendments to this Annex.

D. Both sides will share the data acquired and the results of the data analyzed.

IV. DESIGNATION OF PROJECT LEADERS

The Project Leaders designated at this stage for the United States are:

A. Health Effects of Air Pollution from Coal Combustion

Dr. Vilma R. Hunt
Deputy Assistant Administrator
for Health Research
Office of Research and Development
U.S. Environmental Protection Agency
Washington, D.C. 20460

Dr. Gordon Hueter
Director
Health Effects Research Laboratory
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

Health Effects of Drinking Water Contamination

Dr. Vilma R. Hunt
Deputy Assistant Administrator
  for Health Research
Office of Research and Development
U.S. Environmental Protection Agency
Washington, D.C. 20460

Dr. John Garner
Director
Health Effects Research Laboratory
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

C. Biological Accumulation of Environmental Pollutants

Dr. Vilma R. Hunt
Deputy Assistant Administrator
  for Health Research
Office of Research and Development
U.S. Environmental Protection Agency
Washington, D.C. 20460

Dr. Courtney Riordan
Deputy Assistant Administrator for
  Monitoring and Technical Support
Office of Research and Development
U.S. Environmental Protection Agency
Washington, D.C. 20460

The Project Leaders designated at this stage for China are:

A. Health Effects of Air Pollution from Coal Combustion

Mr. Bi Zhi-Xian
Deputy Director
Bureau of Industrial Health
Ministry of Health
Beijing, People's Republic of China

Mr. Cao Shou Ren
Deputy Director of Environmental Health
Institute of Hygiene
Chinese Academy of Medical Sciences
Beijing, People's Republic of China

Health Effects of Drinking Water Contamination

Mr. Bi Zhi-Xian
Deputy Director
Bureau of Industrial Health
Ministry of Health
Beijing, People's Republic of China

Mr. Chen Changjie
Deputy Chief
Division of Environmental Health
Institute of Hygiene
Chinese Academy of Medical Sciences
Beijing, People's Republic of China

C. Biological Accumulation of Environmental Pollutants

Mr. Bi Zhi-Xian
Deputy Director
Bureau of Industrial Health
Ministry of Health
Beijing, People's Republic of China

Mr. Wong Zi Si
Deputy Director
Institute of Hygiene
Chinese Academy of Medical Sciences
Beijing, People's Republic of China

PROTOCOL BETWEEN THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND THE OFFICE OF THE ENVIRONMENTAL PROTECTION LEADING GROUP OF THE STATE COUNCIL OF THE PEOPLE'S REPUBLIC OF CHINA FOR SCIENTIFIC AND TECHNICAL COOPERATION IN THE FIELD OF ENVIRONMENTAL PROTECTION

ANNEX 2

ENVIRONMENTAL POLLUTION CONTROL

I. GENERAL

This Annex presents selected study areas for cooperative research on environmental pollution control. A detailed joint proposal for each specific project will be approved by the Working Group. Joint proposals for each project will be prepared by the performing institution and/or scientists and the corresponding counterpart. The selected study areas below do not exclude other cooperative activities or projects which might be deemed desirable by the parties for inclusion under this Protocol.

II. ITEMS FOR COOPERATION

A. Control of fine particles from coal combustion:

1. The US side will provide information on baghouse. This would include theory of collection, range of application, efficiency of operation, and measurement techniques.

2. The Chinese side will provide information on Venturi particulate scrubbers in operation, and information on pilot plant experience with high-voltage electrostatic precipitators.

B. Control of Pollution from Fluidized Bed Combustors:

1. The Chinese side will provide assembly drawings for the 130 ton per hour fluidized bed combustor test units and information on combustion including test data on coal combustion and actual performance data.

2. The US side will provide assembly drawings for the 136 ton per hour fluidized bed combustor from Foster Wheeler Company. This will include information on testing, operation, and sulfur removal.

C. Other Pollution Control Techniques:

1. The US side will provide information regarding regenerable scrubber technology for the control of SO_x.

2. The Chinese side will provide information on pilot plant use of the Wellman Lord process for removing sulfur from coal combustion.

D. The US hopes to be able to visit pollution control facilities in the People's Republic of China before July 1981. The Chinese side will give active consideration. The detailed arrangements will be determined by the US and China Working Group through correspondence.

III. DESIGNATION OF PROJECT LEADERS

The Project Leaders designated at this stage for the United States are:

A. Control of Fine Particles from Coal Combustion

Dr. Steven R. Reznek
Deputy Assistant Administrator for Environmental
Engineering and Technology (RD-681)
Office of Research and Development
U. S. Environmental Protection Agency
Washington, D. C. 20460

B. Control of Pollution from Fluidized Bed Combustors

Dr. Steven R. Reznek
Deputy Assistant Administrator for Environmental
Engineering and Technology (RD-681)
Office of Research and Development
U. S. Environmental Protection Agency
Washington, D. C. 20460

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C. Other Pollution Control Techniques

Dr. Steven R. Reznek
Deputy Assistant Administrator for Environmental
Engineering and Technology (RD-681)
Office of Research and Development
U. S. Environmental Protection Agency
Washington, D. C. 20460

The Project Leaders designated at this stage for China are:

A. Control of Fine Particles from Coal Combustion

Mr. Chen Guo Qu
Engineer
Institute of Thermal Engineering
Ministry of Electric Power
Beijing, People's Republic of China

B. Control of Pollution from Fluidized Bed Combustors

General Bureau of Electric Power
First Ministry of Machine Building
Beijing, People's Republic of China

C. Other Pollution Control Techniques

Mr. Xu Zheng Zhong
Engineer
Institute of Thermal Engineering
Ministry of Electric Power
Beijing, People's Republic of China

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PROTOCOL BETWEEN THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND THE OFFICE OF THE ENVIRONMENTAL PROTECTION LEADING GROUP OF THE STATE COUNCIL OF THE PEOPLE'S REPUBLIC OF CHINA FOR SCIENTIFIC AND TECHNICAL COOPERATION IN THE FIELD OF ENVIRONMENTAL PROTECTION

ANNEX 3

ENVIRONMENTAL PROCESSES AND EFFECTS RESEARCH

I. GENERAL

This Annex presentsselected study areas for cooperative research on environmental processes and effects research. A detailed joint proposal for each specific project will be approved by the Working Group. Joint proposals for each project will be prepared by the performing institution and/or scientists and the corresponding counterpart. The selected study areas below do not exclude other copperative activities or projects which might be deemed desirable by the parties for inclusion under this Protocol.

II. ITEMS FOR COOPERATION

A. AQUATIC EFFECTS OF ENVIRONMENTAL POLLUTION.

1. The U.S. side will provide information on the methods and results of laboratory testing programs for determining the toxicity of pollutants (especially carcinogens) to aquatic life, methods will include static (P) bioassay, flow-through bioassay, and chronic bioassay techniques "for both marine and aquatic systems."

2. The Chinese side will provide information on its aquatic toxicity testing programs and on field studies of aquatic pollution.

3. The U.S. side will provide information on the use of models, microcosms, and field ecology studies to validate the significance of laboratory results.

4. The U.S. side will provide information on its approaches to the problem of establishing water quality criteria to protect aquatic life.

5. The U.S. side will provide information on biomonitoring and assessment techniques in which aquatic organisms are utilized to measure the buildup of contaminants in the environment, including its mussel watch program.

6. The U.S. side will send a delegation of experts to China in 1980 or 1981 to facilitate cooperative activities on environmental processes and effects research. This delegation will visit the Beijing Institute of Zoology, Chinese Academy of Sciences; the Institute of Atmospheric Physics, Chinese Academy of Sciences; the Institute of Environmental Chemistry, Chinese Academy of Sciences; the Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan; the Institute of Oceanology, Chinese Academy of Sciences, Quingdao; the Beijing Municipal Institute for Environmental Protection Research; and other research Institutes as appropriate. This delegation will also make arrangements for subsequent visits of U.S. specialists or information exchanges with these facilities as appropriate. The U.S. side will pay the international travel costs and China will pay for the expenses (such as board, lodging, transportation and emergency medical services) incurred by the U.S. experts while they are in China, as allowed by Chinese laws and regulations.

7. The Chinese side will send a delegation of experts to the U.S. to visit the facilities of the U.S. Environmental Protection Agency, Gulf Breeze Environmental Research Laboratory, Narragansett Environmental Research Laboratory, Corvallis Environmental Research Laboratory, and other research institutions, as appropriate. The Chinese side will pay the international travel costs and the U.S. will pay for expenses (such as travel, lodging, board, and emergency medical expenses) incurred by the Chinese experts while they are in the United States, as allowed by U.S. laws and regulations.

8. In addition to information exchange, the exchange of delegations is aimed at exploring the opportunities for joint or parallel studies, e.g., the toxicology of common pollutants in fish, which are designed to extend and supplement the information base. These may include parallel studies of the same pollutants, using different aquatic species to extend the range of information of toxic effects; joint studies of different classes of chemicals using the same or similar aquatic species; and joint biomonitoring studies.

B. POLLUTION OF SOIL AND GROUND WATER.

1. The U.S. side will provide information on its studies of ground water pollution, including development of ground water transport models.

2. The Chinese side will provide information on studies of the contamination of soil, ground water, and food crops stemming from the use of municipal sewage for farmland irrigation.

3. The U.S. side will provide information on studies of contamination of soil by bacteria, metals, viruses and other pollutants stemming from use of soil systems for municipal waste disposal.

4. The U.S. side will provide techniques for the separation, identification, and determination of trace quantities of organic pollutants.

5. The U.S. delegation of experts to China will visit ground water research facilities in Beijing, and will make arrangements for subsequent working exchanges of experts or information exchanges as appropriate. The U.S. side will pay the international travel costs and China will pay for the expenses (such as board, lodging, transportation and emergency medical expenses) incurred by the U.S. experts while they are in China, as allowed by Chinese laws and regulations.

6. In 1981 the Chinese side will send a delegation of experts to visit the U.S. Environmental Protection Agency laboratories at Ada, Oklahoma and Athens, Georgia. The Chinese side will pay the international travel costs and the U.S. will pay for expenses (such as transportation, board, lodging, and emergency medical expenses) incurred by the Chinese experts while they are in the United States, as allowed by U.S. laws and regulations.

C. MODELING OF AIR POLLUTANT TRANSPORT AND TRANSFORMATION.

1. The U.S. side will provide information on measures for the detection of short-, medium- and long-range air transport and local detection of horizontal flow fields for particulates, sulfur dioxide, oxidants, and aerosols, and on the establishment and use of models in developing control strategies.

2. The Chinese side will provide information on its studies of atmospheric

3. The U.S. side will provide information on the techniques for characterization and modeling of the atmospheric transformation of contaminants (particulates, sulfur dioxide, polynuclear aromatic hydrocarbons, and oxidants, particularly chemical oxidants).

4. In 1980 or 1981, the U.S. delegation of experts to China will visit the Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing and other appropriate research facilities and will make arrangements for subsequent working exchanges or information exchanges as appropriate. The U.S. side will pay the international travel costs and China will pay for the expenses (such as board, lodging, transportation and emergency medical services) incurred by the U.S. experts while they are in China, as allowed by Chinese laws and regulations.

5. In 1980, a delegation of Chinese scientists will visit the U.S. Environmental Protection Agency's Environmental Research, Monitoring and Support Laboratories; several Department of Energy National Laboratories currently participating in the development of sulfate transport models for the Environmental Protection Agency; and the National Center for Atmospheric Research. The Chinese side will pay the international travel costs and the U.S. will pay for expenses (such as travel, lodging, board, and emergency medical services) incurred by the Chinese experts while they are in the United States, as allowed by U.S. laws and regulations.

D. MODELING OF WATER POLLUTION TRANSPORT.

1. The U.S. side will provide information on techniques for modeling pollutant transport and transformation in surface water, including the EXAM model, urban storm water models, and other hydrologic and sanitary engineering models.

2. The Chinese side will provide information on their experiences in modeling pollutant transport.

3. The U.S. delegation of experts to China will visit the Institute of Environmental Chemistry, the Chinese Academy of Sciences and other facilities conducting work on pollutant transport and behavior in surface water, and will

ke arrangements for subsequent working exchanges or information exchanges as appropriate. The U.S. side will pay the international travel costs and China will pay for the expenses (such as board, lodging, transportation and emergency medical services) incurred by the U.S. experts while they are in China, as allowed by the Chinese laws and regulations.

4. The Chinese side will send a delegation of experts to visit the U.S. Environmental Protection Agency's Athens Environmental Research Laboratory and several academic institutions active in water pollution transport modeling. The Chinese side will pay the international travel costs and the U.S. will pay for expenses (such as travel, lodging, board and emergency medical services) incurred by the Chinese experts while they are in the United States, as allowed by U.S. laws and regulations.

III. GENERAL PROVISIONS

The exchange of expert delegations as described in Sections II.A, B, C, and D of Annex 3 will be of equal size and duration.

IV. DESIGNATION OF PROJECT LEADERS

The Project Leaders designated at this stage for the United States are:

A. Aquatic Effects of Environmental Pollution

Dr. Allan Hirsch
Deputy Assistant Administrator for
Environmental Processes and Effects Research
Office of Research and Development
U.S. Environmental Protection Agency
Washington, D.C. 20460

B. Pollution of Soil and Ground Water

Dr. Allan Hirsch
Deputy Assistant Administrator for
Environmental Processes and Effects Research
Office of Research and Development
U.S. Environmental Protection Agency
Washington, D.C. 20460

C. Modeling of Air Pollutant Transport and Transformation

Dr. Allan Hirsch
Deputy Assistant Administrator for
Environmental Processes and Effects Research
Office of Research and Development
U.S. Environmental Protection Agency
Washington, D.C. 20460

D. Modeling of Water Pollution Transport

Dr. Allan Hirsch
Deputy Assistant Administrator for
Environmental Processes and Effects Research
Office of Research and Development
U.S. Environmental Protection Agency
Washington, D.C. 20460

The Project Leaders designated at this stage for China are:

A. Aquatic Effects of Environmental Pollution

Mr. Li Xian Fa
Deputy Director, Environmental Protection Institute
Municipality of Beijing
Beijing, People's Republic of China

Institute of Hydrobiology
Chinese Academy of Sciences
Wuhan, People's Republic of China

B. Pollution of Soil and Ground Water

Ms. Hu Peng Ming
Deputy Director, Environmental Monitoring Station
Beijing, People's Republic of China

C. Modeling of Air Pollutant Transport and Transformation

Ms. Liu Jing Yi
Deputy Director
Institute of Environmental Chemistry
Chinese Academy of Sciences
Beijing, People's Republic of China

D. Modeling of Water Pollution Transport

Ms. Liu Jing Yi
Deputy Director
Institute of Environmental Chemistry
Chinese Academy of Sciences
Beijing, People's Republic of China

AGREEMENT CONCERNING THREE ANNEXES OF THE PROTOCOL

An eight-man Chinese Environmental Delegation headed by Mr. Li Chaobo, Director, Office of Environmental Protection Leading Group, held discussions with an American delegation led by Douglas Costle, Administrator of the Environmental Protection Agency, and representatives of the Environmental Protection Agency, the Council on Environmental Quality, and the Department of the Interior, in Washington, D.C. during the period May 12-14, 1980.

During the discussions agreement was reached on annexes regarding

- Environmental Health Research
- Environmental Pollution Control
- Environmental Processes and Effects Research

These annexes are hereby incorporated into the U.S.-PRC Environmental Protection Protocol. Agreement in principle was also reached on activities in the areas of

- Environmental Impact Assessment Studies
- Preservation of Nature

Discussions on the Environmental Impact Assessment Studies are continuing. Both sides are seeking respective governmental approval to complete agreement on the Preservation of Nature annex.

The two sides further agreed that they would continue to discuss the conditions and methods of financing future new cooperative projects on the basis of equality, reciprocity, and mutual benefit.

Signed this fourteenth day of May 1980 at Washington, D. C.

Douglas M. Costle

Douglas M. Costle
Administrator, Environmental
Protection Agency
United States of America

Li Chaobo
Director, Office of
Environmental Protection
Leading Group
People's Republic of China

李超伯

PROTOCOL BETWEEN
THE DEPARTMENT OF HEALTH, EDUCATION,
AND WELFARE OF THE
UNITED STATES OF AMERICA
AND
THE MINISTRY OF PUBLIC HEALTH
OF THE PEOPLE'S REPUBLIC OF CHINA
FOR
COOPERATION IN THE SCIENCE AND TECHNOLOGY
OF MEDICINE AND PUBLIC HEALTH

The Department of Health, Education, and Welfare of the United States of America and the Ministry of Public Health of the People's Republic of China (hereinafter referred to as the "two parties");

Implementing the Agreement on Cooperation in Science and Technology signed in Washington on January 31, 1979, between the Governments of the United States of America and the People's Republic of China (hereinafter referred to as the "Science and Technology Agreement");

Recognizing the existence of mutual interests in the promotion of health and the prevention and control of diseases;

Realizing the advantages of international cooperation in advancing knowledge and in resolving common problems in medical science and public health for the benefit of all mankind;

Desiring to promote cooperation in the science and technology of medicine and public health; and

Desiring to develop better communication and understanding between the medicine and public health communities in both countries;

Have agreed as follows:

ARTICLE I

GENERAL PRINCIPLES

1. All activities pursuant to this Protocol shall be conducted in compliance with the terms of the Science and Technology Agreement.

2. Cooperative activities, where appropriate, will be coordinated with the goals and activities of the World Health Organization.

ARTICLE II

METHODS OF COOPERATION

The methods of cooperation under this Protocol shall include:

1. Exchange of scientists, specialists, delegations and scientific and technical information in the health and biomedical sciences;

2. Coordination of scientific research projects and programs for cooperation;

3. Joint organization of seminars, conferences and lectures;

4. Exchange and provision of biological standards, bacterial and viral strains, reagents and samples, and other materials for laboratory tests and control; and

5. Other methods of cooperation mutually agreed by the two parties.

ARTICLE III
AREAS OF COOPERATION

1. The following areas have been agreed upon for initial cooperative activities:

A. Infectious and parasitic diseases;

B. Cancer;

C. Cardiovascular diseases;

D. Public health and health services research;

E. Medical information science;

F. Immunology; and

G. Medical genetics.

2. The following areas were agreed upon for subsequent cooperative activities:

A. Reproductive physiology and family planning techniques;

B. Pharmacology;

C. Industrial hygiene and environmental health;

D. Organ transplantation;

E. Burns;

F. Microsurgery;

G. Biomedical engineering; and

H. Mental health.

3. Cooperative activities may be undertaken in such other areas as are mutually agreed by the two parties.

ARTICLE IV

ORGANIZATION OF COOPERATION

1. The two parties agree to establish a joint committee for cooperation in medicine and public health which shall be responsible for the implementation of this Protocol, subject to the guidance of the U.S.-PRC Joint Commission on Scientific and Technological Cooperation established under the Science and Technology Agreement.

2. The Joint Committee shall be co-chaired by the Assistant Secretary for Health, Department of Health, Education, and Welfare of the United States of America, and the Vice Minister, Ministry of Public Health, of the People's Republic of China, or equal officials designated by them.

3. The Joint Committee shall be composed of an equal number of up to five representatives from each country and shall meet, at times mutually agreed, in the United States of America and the People's Republic of China alternately.

4. The Joint Committee shall hold its first meeting as soon as possible at a mutually convenient time after the entry into force of this Protocol.

5. The Joint Committee shall be responsible for:

A. Establishing the policies and procedures for its activities to be carried out under this Protocol, and consulting on the disposition of the resultant intellectual property and other appropriate matters;

B. Identifying specific areas of cooperation;

C. Planning, coordinating and evaluating cooperative activities;

D. Determining the initiation and termination of cooperative activities;

E. Determining the appropriate documentation for activities of the Joint Committee;

F. Determining the forms of organization and means of communication for each cooperative area.

ARTICLE V

FINANCING

Cooperative activities shall be financed as agreed upon by the Joint Committee.

ARTICLE VI

ANNEXES

All understandings of the Joint Committee with respect to the conduct of specific activities under this Protocol shall be set forth in Annexes to this Protocol.

ARTICLE VII

ENTRY INTO FORCE, DURATION AND AMENDMENT

This Protocol shall enter into force upon the date of signature and shall remain in force for five years. It may be extended or modified by mutual agreement of the two parties.

Done in duplicate in Beijing on June 22, 1979, in the English and Chinese languages, the two texts being equally authentic.

Joseph A. Califano, Jr.

For the Department of Health
Education, and Welfare
United States of America

For the Ministry of Public Health
People's Republic of China

ANNEX ONE

TO THE PROTOCOL BETWEEN

THE MINISTRY OF PUBLIC HEALTH
OF THE PEOPLE'S REPUBLIC OF CHINA

AND

THE DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OF THE UNITED STATES OF AMERICA

FOR

COOPERATION IN THE SCIENCE AND TECHNOLOGY OF MEDICINE AND PUBLIC HEALTH

I. In pursuance of the Protocol between the Ministry of Public Health of the People's Republic of China and the Department of Health, Education and Welfare of the United States of America for Cooperation in the Science and Technology of Medicine and Public Health, as signed in Beijing on June 22, 1979, the US-PRC Joint Committee for Cooperation in Medicine and Public Health held its first session in Beijing on June 25-26, 1979. The list of members of the Joint Committee and participants of the First Session is attached (Appendices 1 and 2).

II. The Joint Committee expressed its great satisfaction with the signing of the Protocol and the opportunity it has provided to implement an effective program of cooperation in the health sciences for the benefit of both countries and of all mankind. During the first session of the Joint Committee, discussions were focused on scientific areas for cooperation and on matters of organization and finance. The Joint Committee agreed upon the initiation of activities, as described below, subject to the approval of corresponding authorities of the respective countries.

III. Both sides agreed to consider the following subjects for cooperative research in the initial stages of cooperation:

A. Infectious and Parasitic Diseases

1. Viral Hepatitis: Experiments, trial production and clinical application of vaccines for hepatitis, type B;

2. Schistosomiasis: Studies of immunology and anatomical pathology;

3. Influenza: Experiments and trial production of sub-unit vaccine and inactivated vaccine, and epidemiological surveillance;

4. Malaria: Control of vectors, research on more effective treatment methods, and development of vaccines.

B. Cancer

1. Laboratory approaches:

    a. Chemical carcinogenesis, including:

        (1) Diet and nutrition;

        (2) Precarcinomatous treatment;

        (3) Fungus toxins;

        (4) Role of nitrites in pathogenesis of carcinoma of the esophagus.

    b. Biochemical aspects, such as cancer-inhibitory substances in urine;

    c. Cancer biology, including genetics;

    d. Tumor virology and immunology.

2. Clinical approaches:

    a. Diagnostic, including radiology and pathology;

    b. Combined therapy of cancer.

3. Epidemiological approaches, including field studies and prevention activities in relation to selected, important types of cancer.

C. Cardiovascular Diseases

1. Research relating to arterio-sclerosis:
    a. Biochemistry and genetics, such as carrier lipo-proteins;
    b. Pathology, such as mechanisms of plaque formation on artery walls, including animal models;
    c. Epidemiology, such as the relation of risk factors to severity of diseases, and controlled clinical trials to assess preventive or therapeutic interventions;
    d. Research relating to the physiology and biochemistry of the heart, with special reference to the prevention of heart anoxemia and anoxia.
2. Research relating to pulmonary vascular diseases, such as cor-pulmonale and micro-circulation.

D. Public Health and Health Services Research

1. Biochemical and epidemiological research relating to silicosis, fibrogenesis and collagen;
2. Nutritional and environmental factors facilitating mental and physical development;
3. Health of children and adolescents, including;
    a. Comparative studies of child growth and development in the two countries;
    b. Endocrinology of growth, and biochemistry of brain development;
    c. Prenatal and perinatal care;
    d. Promotion of oral health and dental care in children.
4. Toxicology of Pesticides:
    a. Biochemistry of pesticides;

        b. Short-term, rapid methods of detection of carcinogenesis, teratogenesis and mutagenesis;

        c. Environmental toxicology, including effects of occupational exposures and preventive interventions.

    5. Primary Health Care, or Basic-Level Health Services, Including:

        a. Organization, financing and management of services.

        b. Health manpower policy;

        c. Development of a basic-level health services network for the entire population;

        d. Development of data base as foundation for guiding research cooperation.

    6. Ways of integrating research and health care.

E. Medical Information

    1. Exchange of medical information;

    2. The Chinese side to send technical personnel to the U.S. to take post-graduate training in modern methods of handling medical information, including use of computer systems; and the Chinese side to assist U.S. side in developing capability for cataloguing Chinese library materials.

F. Immunology

    1. Immunological studies to be pursued in relation to a variety of problem areas, including infectious and parasitic diseases, cancer, chronic diseases, and skin and organ transplantation, and to involve:

        a. Basic immunology;

        b. Genetic immunology;

        c. Immuno-biochemistry.

G. Medical Genetics

1. Genetics of somatic cells, such as the localization of human genes;
2. Genetic diseases, such as immuno-deficiency diseases, hemoglobinopathies, hemolytic diseases, and in-born errors of metabolism;
3. NIH will make available to the PRC its documentation relating to the guidelines on recombinant DNA research.

IV. Detailed arrangements for the implementation of these activities, including time of activities, number of participants involved in each activity and methods of cooperation, shall come into effect after specific proposals have been submitted by the Coordinators in each of the seven cooperative areas, and after approval by the Joint Committee chairmen of both sides. The Coordinators in each cooperative area shall communicate with each other at the earliest possible date and decide the optimum manner for developing a specific proposal for cooperative activity to be submitted to the Joint Committee chairmen for approval.

V. The Coordinators in each cooperative area shall be designated, generally in equal numbers, by the Joint Committee chairmen on each side. The Coordinators designated at this stage from China are:

A. Infectious and Parasitic Diseases

Professor Mao Shoubi
Institute of Parasitic Diseases
Chinese Academy of Medical Sciences
Shanghai

and

Professor Huang Zhenxiang
Institute of Virology
Chinese Academy of Medical Sciences
Beijing

B. Cancer

Dr. Wu Huanxing
Director
Institute of Oncology
Chinese Academy of Medical Sciences
Beijing

and

Dr. Li Bing
Deputy Director
Institute of Oncology
Chinese Academy of Medical Sciences
Beijing

C. Cardiovascular Diseases

Professor Wu Yingkai
Fuwai Hospital
Chinese Academy of Medical Sciences
Beijing

D. Public Health and Health Services Research

Professor Yang Mingding
Shanghai First Medical College
Shanghai

E. Medical Information

Professor Li Sigiao
Associate Professor
Institute of Information
Chinese Academy of Medical Sciences
Beijing

F. Immunology

Professor Liu Shilian
Associate Professor
Institute of Basic Medical Science
Chinese Academy of Medical Sciences
Beijing

G. Medical Genetics

Professor Wu Min
Associate Professor
Institute of Oncology
Chinese Academy of Medical Sciences
Beijing

The Coordinators designated at this stage from the United States are:

A. Infectious and Parasitic Diseases

Dr. William Foege
Director
Center for Disease Control
Department of Health, Education, and Welfare
Atlanta, Georgia

B. Cancer

Dr. Vincent DeVita
Director
National Cancer Institute
National Institutes of Health
Bethesda, Maryland

C. Cardiovascular Diseases

Dr. Robert Levy
Director
National Heart, Lung and Blood Institute
National Institutes of Health
Bethesda, Maryland

D. Public Health and Health Services Research

Dr. John Bryant
Deputy Assistant Secretary
  for International Health
Director, Office of International Health
Department of Health, Education, and Welfare
Washington, D.C.

E. Medical Information Science

Dr. Martin Cummings
Director
National Library of Medicine
National Institutes of Health
Bethesda, Maryland

F. Immunology

Dr. Richard Krause
Director
National Institute of Allergy
and Infectious Diseases
National Institutes of Health
Bethesda, Maryland

G. Medical Genetics

Dr. Donald Fredrickson
Director
National Institutes of Health
Bethesda, Maryland

VI. Substitution of a Coordinator in any cooperative area can be decided by the Joint Committee chairman from either side. The opposite side shall be notified promptly. The number of Coordinators can be increased or reduced as necessary, subject to the joint agreement of the chairmen of both sides.

VII. Duties and responsibilities of the Coordinators are:

A. The Coordinators shall exchange views and information on subjects of common interest in the cooperative areas;

B. The Coordinators shall identify specific research topics and activities to be undertaken in the areas of cooperation and submit plans and proposals for cooperation to the Joint Committee chairmen;

C. The Coordinators shall be familiar with the progress of cooperative activities, and shall submit progress reports as established by the Joint Committee chairmen.

VIII. The administrative body for implementing this Annex on China's side is the Bureau of Foreign Affairs of the Ministry of Public Health; on the U.S. side, the Office of International Health of the Department of Health, Education, and Welfare.

IX. The Joint Committee also agreed to institute an "Individual Specialists Exchange Program" to provide the possibility of reciprocal exchanges in scientific areas not included in the cooperative activities listed in paragraph 3 on pages 2-5. The terms of this program will be decided by the Joint Committee chairmen through consultation on a case-by-case basis.

X. Financing the cooperative activities shall be carried out according to the principles of reciprocity and equality.

A. In reciprocal exchanges, the sending side shall bear the round-trip travel expenses to/from the entry/exit city of the host side, while expenses for board, lodging, travel within-country, emergency medical and dental services, necessary allowances, costs for participation in scientific meetings, for the use of interpreters, and for related costs of research shall be borne by the host side.

B. For non-reciprocal exchanges of personnel, the benefiting side shall be responsible for all costs.

C. Expenses for board and lodging, and necessary allowances shall be established by the Joint Committee chairmen through correspondence.

D. All material and information, biological standards, reagents and samples necessary for the implementation of cooperative activities can be regarded as a gift without charge.

E. The responsibility for any other costs associated with the cooperative activities (e.g., costs of specialized scientific equipment or material necessary for joint activities) will be determined on a case-by-case basis by the Joint Committee chairmen.

XI. The date for the next session of the Joint Committee shall be jointly decided by the chairmen of both sides after certain progress has been reached in cooperative activities.

Appendix 1

Chinese Members Attending the First Meeting of THE JOINT COMMITTEE

Dr. Guo Ziheng (PRC Co-Chairman)
Vice Minister
Ministry of Public Health
Beijing

*Dr. Gu Fangzhou
Vice President
Chinese Academy of Medical Sciences
Ministry of Public Health
Beijing

Dr. Chen Haifeng
Acting Director
Bureau of Medical Science and Technology
Ministry of Public Health
Beijing

Dr. Cheng Keru
Deputy Director
Bureau of Foreign Affairs
Ministry of Public Health
Beijing

Prof. Wang Yilan
Associate Professor
Shanghai First Medical College
Shanghai

Other Chinese Participants Attending the First Meeting of
THE JOINT COMMITTEE

Mr. Wu Yikang
Chief-Division
State Commission of Science and Technology
Beijing

Mr. Jiang Fuqiao
Chief-Division
Department of Treaty and Legal Affairs
Ministry of Foreign Affairs
Beijing

Dr. Liu Yunsheng
Staff Member
Bureau of Medical Science and Technology
Beijing

Mr. Cong Zhong
State Commission of Science and Technology
Beijing

*Dr. Huang Jiasi
President
Chinese Academy of Medical Sciences
Beijing
((Will be the regular member of the Joint Committee)

APPENDIX 2

U.S. Members Attending the First Meeting of

THE JOINT COMMITTEE

Dr. Julius Richmond (U.S.Co-Chairman)
Assistant Secretary for Health
and Surgeon General
U.S. Public Health Service
Department of Health, Education, and Welfare
Washington, D.C.

Dr. John Bryant
Deputy Assistant Secretary
for International Health
Director, Office of International Health
Department of Health, Education, and Welfare
Washington, D.C.

*Dr. Thomas Malone
Deputy Director
National Institutes of Health
Bethesda, Maryland

Dr. David Hamburg
President
Institute of Medicine
National Academy of Sciences
Washington, D.C.

Dr. Lester Breslow
Dean
School of Public Health
University of California at Los Angeles
Los Angeles, California

*Dr. Donald Fredrickson
Director
National Institutes of Health
Bethesda, Maryland
(Will be the regular member of the Joint Committee)

ANNEX TWO

TO THE PROTOCOL BETWEEN

THE DEPARTMENT OF HEALTH AND HUMAN SERVICES OF THE UNITED STATES OF AMERICA

AND

THE MINISTRY OF PUBLIC HEALTH OF THE PEOPLE'S REPUBLIC OF CHINA

FOR

COOPERATION IN THE SCIENCE AND TECHNOLOGY OF MEDICINE AND PUBLIC HEALTH

Tianjin, China
November 19-20, 1980

Annex Two
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ANNEX TWO

Introduction

In pursuance of the protocol between the Ministry of Public Health of the People's Republic of China and the Department of Health and Human Services of the United States of America for Cooperation in the Science and Technology of Medicine and Public Health, as signed in Beijing on June 22, 1979, and amended by the Agreed Minutes of Discussion between Secretary Harris and Health Minister Qian in June, 1980, the U.S.-P.R.C. Joint Committee for Cooperation in Medicine and Public Health held its second session in Tienjin, China, on November 19-20, 1980. The meeting was co-chaired by the Vice Minister for Public Health, Dr. Huang Shuze, representing China, and Dr. Julius B. Richmond, Assistant Secretary for Health, representing the U.S. (Attachment A lists the members of the Joint Committee and Scientific Area Coordinators).

The Joint Health Committee confirmed the three new areas agreed upon in June, 1980 by Secretary Harris and Minister Qian: Reproductive Physiology and Family Planning Techniques; Food and Drugs, including Pharmacology; and Mental Health.

The Joint Health Committee reviewed the status of the cooperative activities and plans for the ten scientific areas: seven specified in Annex One to the Protocol and the three additional ones agreed to by Secretary Harris and Minister Qian. The Joint Health Committee expressed its great satisfaction with the reciprocal study visits of some Coordinators, the discussions on the cooperative areas, and the proposals for future cooperative activities submitted by the Coordinators. The Joint Health Committee noted that the successful implementation of the cooperative plans in the Science and Technology of Medicine and Public Health will contribute to improving the health of the people of our two nations.

Summary Status Reports and Plans

The Joint Health Committee reviewed and approved the following proposed collaborative activities which are briefly summarized below.

I. Infectious and Parasitic Diseases

  A. Subjects for Cooperative Research

    1. Viral Hepatitis B

      a. Field trials of hepatitis B vaccine

    2. Schistosomiasis and Malaria

      a. Exchange of scientific visits and information relating to laboratory methods and control systems.

  B. Exchange of Scientific Visits and Equipment Required

    1. Viral Hepatitis B

      a. One to two U.S. epidemiologists and 1-2 U.S. virologists (total 3) to visit China in 1981 for 2-4 weeks to advise on study design and laboratory diagnosis.

      b. One to two technical specialists from China to visit U.S. for 1-3 months at NIH to study the preparation of hepatitis B vaccine.

      c. The U.S. side to provide equipment and reagents as specified in the protocol for diagnosis of hepatitis. The Chinese side to bear the costs and equipment needed fo field trials.

    2. Schistosomiasis and Malaria

      a. Exchange of scientific visits: two CDC staff to travel to China for consultation for 3-4 weeks in 1981.

      b. Collaborative Research and Consultations: one entomologist from China to spend one year in the U.S. for training in physical, chemical, and biological control methods. One scientist from China to spend six months in primate centers in the U.S. One scientist from China to travel to CDC for three months for consultation on the purification of schistosome antigens.

c. Seminars and workshops in China in 1981: One for biology and control of A. Balabacensis and A. Sinensis, including travel of three specialists from the U.S. for about ten days. One workshop on purification and characterization of schistosome antigens to include travel for four specialists from the U.S. for three weeks.

II. Cancer

A. Subjects for Cooperative Research

1. Cancer epidemiology, including computer mapping, use of cancer registries, and case-control studies in high rate areas.

2. Cancer detection and diagnosis, including use of new techniques for biologic or immunologic markers and ultrasound imaging.

3. Cancer treatment.

4. Studies of esophageal cancer in China.

B. Exchanges of Scientific Visits and Materials

1. Four medical scientists from the PRC to be considered for one year visiting fellowships at the NCI beginning in 1981 to gain experience in the above subject areas.

2. Four medical scientists from the NCI to visit the high rate area for esophageal cancer in China for one month in 1981 or 1982 to evaluate progress on the binational research efforts there.

3. NCI to provide new chemotherapy drugs and methods not yet available in China for the treatment of esophageal cancer.

III. Cardiovascular Diseases

A. Subjects for Cooperative Research

1. Cardiovascular epidemiology

a. Major study of the epidemiology of cardiovascular diseases, including risk factors, in selected areas of China.

2. Biochemical and cellular studies of human atherosclerosis

3. Hypertension and nutrition.

B. Exchange of Scientific Visits and Information

1. Two medical scientists from the PRC to spend one year in the U.S. beginning in 1981 for joint work on the biochemistry of atherosclerosis and cellular studies of human atherosclerosis.

2. A small group (2-3) of Chinese cardiovascular specialists to visit the U.S. in March, 1981 to discuss details for further cooperation.

3. Four U.S. scientists to visit China in April 1981 for approximately one month to initiate discussions and to plan the joint U.S.-P.R.C. studies of the epidemiology of cardiovascular diseases.

IV. Public Health and Health Services Research

A. Health Services Research

1. Subjects for Cooperative Research

a. Descriptive studies of defined population areas in Shanghai County, according to detailed plans mutually agreed upon, including health services to be provided with particular attention to health status outcomes.

b. The Child Health and Nutrition subgroup to include in the above study an epidemiological analysis of pregnancy outcomes and associative causative factors, with emphasis on low birth weight infants. A limited, exploratory study to be done in Ye Xian at an appropriate time.

c. Descriptive studies of detailed population areas in the U.S., following the parameters listed above under (a) and (b).

d. Evaluative research projects involving developing methods, and implementing and evaluating approaches to priority problems such as hypertension, cancer, bronchitis and prenatal diagnosis in the above geographical areas.

e. Extension of study findings to other areas of China.

2. Exchanges of Scientific visits and Information and Other Resources Needed.

a. Two to three U.S. scientists to visit China for 3-5 months in early 1981 to cooperate in the descriptive study of Shanghai County, in a limited study in Ye Xian County, and in the training of local medical workers.

b. Workshops in China in the summer or fall of 1981 to review results of descriptive study (4-6 U.S. scientists will participate).

c. A Symposium to be held in the U.S. at an appropriate time based on (2a) and (2b).

d. Delegation of Chinese scientists to visit the U.S. in 1981 for three weeks to plan descriptive study in the U.S., and for other purposes related to the area of health services research.

e. Beginning in 1981, up to four Chinese scientists to be trained in the U.S. for one year periods in health services research, epidemiology and related fields.

f. Beginning in 1981, visiting U.S. scientists to be provided necessary office facilities.

B. Child Development and Nutrition

This section is coordinated closely with health services research and human genetics. See those sections for details.

C. Environmental and Occupational Health

1. Subjects for Cooperative Research

a. Toxicological and epidemiological research related to asbestosis, silicosis, byssinosis, coal workers' pneumonoconiosis, and other pneumonoconioses.

b. Toxicological and epidemiological research related to pesticides and metals in the work place and community.

c. Development and validation of short-term test methods for carcinogens, mutagens, and teratogens.

d. Application of standard toxicologic methods and extrapolation of animal data to man.

e. Cooperation in the development of pollution standards (air and water) in the work place and general environment.

2. Exchange of Scientific Visits and Information.

a. Exchanges/visits of 4-6 U.S. and PRC scientists in 1981, to define scientific areas of joint cooperation. During U.S. visit to China, a symposium or workshop to be held on selected subjects taken from the above list.

b. Visit of 2-3 Chinese scientists to the U.S. for 3-4 months in 1981 in the areas of short-term testing, environmental toxicology and asbestos and metal epidemiology.

c. Increase the availability and exchange of technical information in the field.

V. Biomedical Information Sciences

A. Subjects for Cooperative Activity

1. The Chinese Academy of Medical Sciences (CAMS) to assist the National Library of Medicine (NLM) in cataloging its old Chinese traditional medicine collection.

2. The NLM to assist the CAMS in training in modern library management and cooperation.

B. Exchange of Scientific Visits

1. The CAMS to send two persons to the U.S. in 1980-81 to assist the NLM in cataloging.

2. The CAMS to send two persons to the U.S. in 1981 for training in indexing and cataloging and the management of a modern national library of medicine.

C. The CAMS and NLM to continue to exchange their publications, as appropriate.

VI. Immunology

A. Subjects for Cooperative Research

1. Cooperation in immunology to include the following approaches:

a. Immunobiology

b. Immunogenetics

c. Molecular immunology

d. Immunopharmacology

e. Clinical immunology

2. Specific Subjects for Cooperative Research

  a. HLA tissue typing and disease associations

  b. Allergy (Specific topics to be discussed)

  c. General area of immunity to infections (further plans to be discussed).

  d. Specific problems of clinical immunology including rheumatology (further plans to be discussed).

B. Scientific Activities and Exchange of Information

  1. Two to four Chinese research fellows to be trained in the U.S. in 1981 in the areas of immunogentics and allergy.

  2. A working group of 3-5 scientists from each country to meet in the U.S. in 1981 to outline specific areas of cooperation in the field of allergy.

  3. Both sides to facilitate exchange of information and biological materials related to the field of immunology.

  4. Both sides to explore possible P.R.C. participation in conferences in immunology held in connection with U.S. bilateral programs with other countries.

VII. Human Genetics (and Report on Child Development and Nutrition)

A. Subjects for Cooperative Activity

  1. Development of cellular genetics, including human gene mapping using somatic cell hybrids.

  2. Population genetics, including: hemoglobin variants in China, G-6-PD variants in defined population groups, protein polymorphism and lactose tolerance.

  3. Initiation of mass screening programs including phenylketonuria, hypothyroidism, and maple syrup urine disease.

  4. Nutrition and genetics, including rickets, hypothyroidism and nutritional treatment of genetic disease.

  5. Epidemiology of the outcome of pregnancy to be carried out in the health services research study sites (see Health Services Research section).

B. Exchange of Scientific Visits and Information

1. In early 1981, a delegation of Chinese scientists to visit the U.S. to emphasize the above areas. A workshop to be held in the U.S. at the conclusion of the visit.

2. Training programs for Chinese scientists in U.S. laboratories and institutions in the above subject areas to be started as soon as possible. 1-2 Chinese scientists to begin one year of training in 1981.

3. A scientific symposium to be held, focused on human and cellular genetics, in China in 1981 or 1982.

VIII. Reproductive Physiology and Family Planning Techniques

A. Subjects for Cooperative Activity to be decided by both sides at a later date.

B. Exchanges of Scientific Visits

A delegation of four scientists from the U.S. to visit China in the spring of 1981 to explore opportunities for collaborative research.

IX. Mental Health

A. Subjects for Cooperative Activities

1. Clinical pharmacology, including a cross-national comparison of blood levels of psychoactive drugs.

2. Genetics and schizophrenia, including an exploration of possible genetic markers through focussing on Chinese families identified as having schizophrenia in at least three generations.

3. Clinical assessment and diagnosis, including comparative diagnosis and assessment of schizophrenia and major affective disorders.

B. Exchange of Scientific Visits and Information

1. Two Chinese scientists to reside at the National Institute of Mental Health (NIMH) beginning in 1981, for training in laboratory methods related to the above subjects.

2. Scientists from NIMH to visit China for periods of 4 to 8 weeks to discuss the above research areas as well as to consider further subjects for research.

X. Food and Drugs

A. Subjects for Cooperative Activity

1. As this subject is a new one for cooperation, the specific topics will be identified during forthcoming exchanges of delegations.

B. Exchange of Scientific Delegations and Information

1. A delegation of Chinese to visit the U.S. in early 1981 for one month and to visit headquarters and field stations of the Food and Drug Administration (FDA).

2. A delegation of U.S. scientists to visit China late in 1981 to develop specific plans for collaborative research activities.

3. Information to be exchanged. FDA to compile a catalog of potentially useful information for China, and the Chinese National Institute for the Control of Pharmaceuticals and Biological Products to provide FDA with a copy of its treatise on the identification of traditional medicines.

MEMBERS OF JOINT HEALTH COMMITTEE AND

SCIENTIFIC AREA COORDINATORS AND COORDINATOR DESIGNEES.

(November 1980)

MEMBERS OF THE JOINT COMMITTEE FOR COOPERATION IN THE SCIENCE AND TECHNOLOGY OF MEDICINE AND PUBLIC HEALTH

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* Not present at Second Joint Health Committee Meeting

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* Not present at Second Joint Health Committee Meeting

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X. Food and Drugs

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Drug and Biological Products

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* Not present at Second Joint Health Committee Meeting

MEMORANDUM OF UNDERSTANDING
BETWEEN THE
NATIONAL INSTITUTES OF HEALTH
OF THE
UNITED STATES OF AMERICA
AND THE
CHINESE ACADEMY OF SCIENCES
OF THE
PEOPLE'S REPUBLIC OF CHINA
ON COOPERATION IN THE
BASIC BIOMEDICAL SCIENCES

The National Institutes of Health of the United States of America and the Chinese Academy of Sciences of the People's Republic of China (hereinafter referred to as the Parties) consider that cooperation in the basic biomedical sciences will strengthen the friendship between scientists of both Parties and enhance knowledge in the biomedical sciences, thus contributing to the health and welfare of all mankind. Acting in the spirit of the Joint Communique on the Establishment of Diplomatic Relations between the United States of America and the People's Republic of China and the Agreement between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology, the Parties agree to the following Understanding for the promotion of further cooperation in the basic biomedical sciences:

Article 1

The Parties agree to conduct cooperative activities and exchanges in the fields of the basic biomedical sciences on the basis of equality, reciprocity, and mutual benefit.

Article 2

The Parties agree that cooperation and exchanges may include the following forms:

1. Exchange of scientists, specialists, scholars, and delegations;

2. Cooperative research, joint organization of symposia and lectures, and other collaborative activities;

3. Exchange of technical information, documentation, and scholarly publications;

4. Exchange and provision of samples, materials, instruments and components for testing, evaluation, and for other purposes related to cooperative activities. Title to any instruments, components or other equipment sent by one side to the other side shall remain with the sending side; any change in title of instruments, components, or other equipment shall be made by mutual written agreement;

5. Such other forms of cooperation as are mutually agreed.

Article 3

Cooperative activities carried out under this Memorandum shall be subject to the availability of funds and manpower to the Parties. The specific tasks, obligations and conditions with respect to the above-mentioned activities, including responsibility for the payment of costs, shall be decided by mutual agreement on a case-by-case basis and shall be confirmed in writing.

Article 4

The Fogarty International Center of the National Institutes of Health and the Bureau of Foreign Affairs of the Chinese Academy of Sciences shall be responsible for facilitating and coordinating cooperative activities between the Parties under this Memorandum. The Fogarty International Center shall be responsible for coordinating the participation in activities under this Memorandum by institutes affiliated with the National Institutes of Health and, whenever possible and appropriate, other American participants. The Bureau of Foreign Affairs shall be responsible for coordinating the participation in activities under this Memorandum by institutes affiliated with the Chinese Academy of Sciences and, whenever possible and appropriate, other Chinese participants.

To facilitate communications between the Parties for cooperative activities and related matters, each side will designate, within one month of the effective date of this Memorandum, one person to act as Program Coordinator for its side. The officials of the Parties and the Program Coordinators designated by the Parties shall, by correspondence or by meetings as the need arises, consult with each other and discuss matters related to the implementation of this Memorandum and to review accomplishments.

Article 5

Scientific and technical results achieved from cooperative activity under this Memorandum may be made available, unless otherwise agreed in writing, to the world scientific community through customary channels and in accordance with the normal procedures of the Parties.

Article 6

In accordance with Article 5 of the aforementioned Agreement on Cooperation in Science and Technology, the Parties agree to reach an accord with respect to treatment of inventions, discoveries, and information subject to copyright arising under this Memorandum. The Parties shall endeavor to reach such an accord within six months of the entry into force of this Memorandum and this accord shall become an Annex thereto.

Article 7

In case of inconsistency between this Memorandum and Annexes thereto, the provisions of this Memorandum shall govern.

Article 8

This Memorandum shall enter into force upon signature by representatives of the Parties and shall remain in force for a five-year period. It may be automatically renewed for succeeding five-year periods unless six months advance notice in writing of intention to terminate is given by either Party. The termination of this Memorandum shall not affect the cooperative projects being carried out under this Memorandum. The Memorandum may be amended by written agreement of the Parties.

Done at Beijing, on the Eleventh day of May 1983, in duplicate in the English and Chinese languages, both texts being equally authentic.

For the
National Institutes of Health
of the
United States of America

For the
Chinese Academy of Sciences
of the
People's Republic of China